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A new future for BCN

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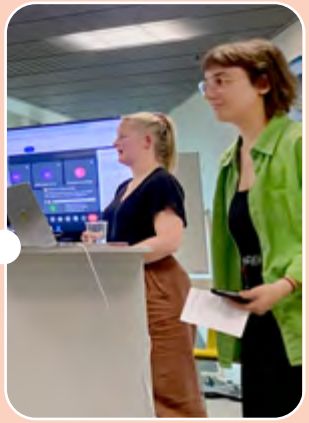
IN THIS ISSUE



FROM THE BOARD ROOM: READY TO START

Dear all,

"Ready to start". It's my favourite song from the band Arcade Fire. It has an uplifting beat and expresses the energy I often feel when embracing the new things that are coming. And many new things are coming, for me and for BCN. Since 1 May 2024 I took over the directorship from Robert Schoevers, who served for nine years. I'm very grateful for all his work, and for the selection committee and board for appointing me as director of BCN. I look forward to meeting all of you, students, PhD-candidates, post-docs, researchers, and staff who all work hard to realize BCN's vision: to stimulate an active interdisciplinary neurosciences community and to enhance translational neurosciences research capable of fostering ground-breaking discoveries.

I would like to take this opportunity to introduce myself: My name is Marie-José van Tol, pleased to meet you. I work as a professor of cognitive neuropsychiatry at the UMCG. This field and my development into it are a nice example of the multi-disciplinary nature of BCN researchers and research, and only one example of many. I'm trained as a clinical- and health psychologist, specialized in neuropsychology, obtained my PhD at departments of psychiatry and radiology, work on questions related to understanding and strengthening mental and emotional well-being and the role of cognition and brain function in it, and study humans for that purpose. I'm committed to connecting research and implementation of resulting knowledge to contribute to good brain health, which I also do in my role as chair of the steering committee of the Netherlands Brain Initiative. Finally, I'm really motivated to contribute to research policy that is most motivating to everyone involved, so we can get to the best research outcomes.

I've been a BCN member since I started working at the UMCG in 2011 and always enjoyed the energy it brought through the people involved. Also, I have to admit, for long time I did not really understand what BCN was. While I knew it united and strengthened neuroscientific research, the specifics of its operations and benefits for research where less clear. The fact that the UMCG also had a research institute called BCN-Brain (after being renamed Brain & Cognition, this institute now joined the UMCG Health in Context, MoHAD, and PRECISION institutes) did not help with that.

For most PhD-candidates and the Research Master Students, it's probably clear what BCN is: a programme providing training to develop "T-shaped researchers" that find a strong basis in one discipline, but with strong capabilities to connect to adjacent scientific fields. Or, you'll soon find out and I hereby would like to welcome all new BCN-members who joined this academic year 2024-2025. But BCN includes more people: post-docs, early-career researchers, assistant-, associate-, and full-professors and other staff-researchers who contribute to the BCN research school, that has been successful since 1987. For those entering BCN in these positions, it probably takes a bit more time to understand what BCN is and how it differs from the other faculty-based research institutes or departments.

In the coming months, I would like to connect to everyone involved in BCN and to start a conversation on what BCN means to you and what you mean for BCN. I would like to hear what you would like to do to stimulate interdisciplinary and translational research and teaching in the neurosciences, how BCN can assist, and how the bottom-up energy that is the hallmark of BCN can help in keeping you motivated and exploring new exciting avenues. For a long time, BCN had an active "think-tank" of BCN principal investigators who advised the board on activities and it would be great to revive such a structure so we can hear from you again. But also, post-docs, still exploring and building up their research profile, likely have ideas how BCN could help in laying a strong foundation for a bright future. Nowadays, a scientific career can be more diverse than 20 years ago, and BCN could also see how it could strengthen its profile in terms of public engagement and open science, ways to also contribute to make a large impact on society through research and teaching.

You will hear from me. Will I hear from you? I look forward to continuing to work on polishing the 'gem' that BCN was considered to be by the recent evaluation committee. For me, the gem is in the community and the energy stemming from the true fascination for our field of study. Let's nourish that, so BCN will shine bright like a diamond (oh wait, that's another song).

● BY MARIE-JOSÉ VAN TOL
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GOODBYE AND WELCOME

Past, Present and Future of BCN

On the 11th of June, a reception was held to bid farewell to Prof. dr. Robert Schoevers who served as the director of the BCN Research School for nearly nine years, and to welcome the new director, Prof. dr. Marie-José van Tol. This event celebrated the stellar scientific evaluation of BCN by an external international Peer Review Committee, honoured the achievements of the BCN Research School and Robert Schoever's leadership, and looked towards the future of BCN under Marie-José van Tol's direction.

The reception opened with an introduction by Prof. dr. Ton Groothuis, who presented the theme of the event as a look at the past, present, and future of BCN. He talked about the scientific evaluation of BCN which was part of an initiative by the board of directors to help modernise. It was an opportunity to take a step back, reflect on the journey so far, and chart the course for the future. The review was very positive, describing BCN as a flagship of the University of Groningen and a hidden gem. Indeed, despite the great work, the coordinators of BCN were "too modest", and more work has to be done in relation to external communication and outreach. The review committee highlighted how the BCN programme has been shown to stimulate interdisciplinarity which is very important for advancing scientific research. Ton Groothuis acknowledged the work of Robert Schoevers as the director of BCN and introduced him and Marie-José van Tol as the next speakers.

Following the introduction, Robert Schoevers delivered an insightful talk about the various aspects of BCN and its accomplishments over the years. The talk started with the question: "What is BCN?" This question does not have a simple answer as there are many facets to BCN.

The review was very positive, describing BCN as a flagship of the University of Groningen and a hidden gem.

It consists of a program, in particular the research Masters which was rated 'Top Degree Programme' in 2019, where one can study the brain from multiple perspectives such as behaviour, cognition, genetics and more. It is a collaboration between 5 graduate schools, giving the opportunity for researchers from different disciplines to come together, sharing their different perspectives with regards to neuroscience. It also stands out in the way it's organised; the educational structure which focuses on gaining experience in research and the opportunities to conduct research with various faculties. Furthermore, the summer schools, BCN retreats, events such as the Nothing but the Truth conference and Marvelous Mind movie nights as well as the BCN Magazine enhance knowledge sharing and promote networking among researchers. Robert Schoevers acknowledged the people involved in all this, including researchers and lecturers who are always willing to learn new things and explore interesting research questions. In light of this, it is important for us to highlight and communicate our successes, as was mentioned in the scientific review. Furthermore, Robert Schoevers pointed out the challenge of making shared decisions which are needed to advance the organisation which requires a more cohesive and inclusive platform to facilitate communication.

Referencing a research paper titled "How to Catalyse Collaboration," Robert Schoevers discussed the essentials for successful interdisciplinary collaboration: a shared mission, constructive dialogue, and the integration of research policy with practice. He highlighted how it is important to develop T-shaped researchers who are not only highly specialised in one area, but have breadth and are mindful of other areas of research which enables them to be flexible in their practice. He also acknowledged the challenge of collaborating with others and how it has not always been easy. In particular, securing funding has been an ongoing struggle since potential sponsors do not always understand what BCN has to offer. Robert Schoevers concluded his talk by thanking everyone involved in BCN including the board, the education committee, and the BCN Office.

It is important to develop T-shaped researchers who are not only highly specialised in one area, but have breadth and are mindful of other areas of research

Marie-José van Tol followed by expressing her enthusiasm on the future of BCN, reiterating the importance of answering the questions of what BCN stands for, what its core beliefs are, and who it serves. In her talk, titled "Goodbye and Hello," she recognized the bittersweet nature of change which comes with the sadness of leaving someone important behind, while embracing the excitement for new beginnings. She continued by sharing how tears of sadness or grief contain more neurotransmitters than other types of tears which are not charged with any emotion. Interestingly, she noted, human tears closely resemble those of owls, using this

to liken Robert to a wise owl whose wisdom guided BCN for nearly nine years and fostered collaboration among diverse research groups. Marie-José praised Robert's humorous and calm leadership style, how he brought in a lot of fresh energy by inviting a young generation of people to the board and his efforts in stimulating a more professional organisation with a clear vision and governance structure.

Marie-José shared her own motivation for the research in BCN; to understand psychiatric disorders, human cognition, and neurodegenerative disorders which are complex and require us to work together, combining research from multiple disciplines in order to find innovative treatments. We need scientists who have in-depth knowledge in their field but we also need them to communicate and collaborate with colleagues in other disciplines, what we refer to as "T-shaped researchers" n BCN. This allows us to foster a sense of community within BCN and a willingness to teach and learn. Marie-José expressed her eagerness to learn about BCN and building connections with different scientists. She shared her priority to get to know the researchers within BCN better in order to align the goals of the research school. She concluded her talk by acknowledging the challenges Robert had outlined and optimistically embraced the future, quoting the famous line, "you say goodbye and I say hello."

Following this, Ronja Eike from the PhD student council delivered a brief talk. She highlighted how the council has grown and that it is comprised of members from diverse backgrounds. The PhD student council organizes a variety of events, both social and educational, aimed at forming connections. Furthermore, it plays an advisory role on the BCN education board, representing the interests of PhD students.

Toon concluded the event by summarizing the key qualities that made Robert Schoevers such an effective director. Groothuis noted Robert's efficiency in keeping meetings focused and productive, as well as his unwavering optimism and enthusiasm. Robert was also able to combine his vision with a down-to-earth attitude. Ton also emphasized Robert's resilience and bold personality, which sustained him throughout his time as director. As a token of appreciation, Ton presented Robert Schoevers with a gift card for a cycling outfit, acknowledging his love for cycling. The event concluded with a reception.

- **BY DANIEL GRECH**
- **PHOTOS BY ZHENYU ZHANG**

BCN research in Art by Science on Wednesday

If your neuroscience was captured in an art work, what would it look like? Soon you'll have an answer, because Science on Wednesday, a BCN-initiated project, does just that. Brain facts from BCN researchers were illustrated by students from Art Academy Minerva. Since the 1st of May, an artwork with a brain fact is published every Wednesday on the website and social media of Wetenschap op Woensdag (Dutch for Science on Wednesday). It is high time to interview one of the organizers, PhD student Franciska de Beer, about the process of turning science into art.

What is Science on Wednesday?

The idea of Science on Wednesday is simple: every Wednesday, we publish an artwork with a brain fact on our website and social media. With this, we aim to bring the excitement of neuroscience to a wide audience and the inhabitants of Groningen. Neuroscience is thrilling, not just for us scientists. Many people outside of academia are interested in how the brain functions and we wanted to show people what fascinating research we do at BCN.

The big goal is to show the Stadjers (inhabitants of Groningen) the fantastic brain research that is happening right next door to them. They often don't know that this research is going on, and that's such a shame.

Why use art to communicate neuroscience?

Well, if we want to communicate neuroscience, there's a lot of information we want to bring across all at once, while we need to capture and keep the persons' attention too. The beauty of art is that one image can convey so many things very clearly: you can tell a story, bring across emotions, and explain things that are important. All the while the artwork grabs people's attention and is pleasing to look at. So we felt that art could do all things neuroscience may have difficulty doing.

I also like that the artwork can give you a whole new perspective on brain research. Some of the research or therapies we do are pretty rough when you encounter them for the first time, such as electric convulsion therapy. With art, you can soften these topics and make them accessible and easier to understand.

What are the origins of Science of Wednesday?

It's a collaboration from the Marvelous Mind team: Marie-José van Tol got funding from the KNAW (Royal Netherlands Academy of Arts and Sciences) to communicate science to a lay public, Robert Schoevers had the idea of a scientific fact every Wednesday and some artwork accompanying it, Iris Sommer supervised the project, and I thought we could collaborate with Art Academy Minerva.

While I still did my bachelor's in Art History and worked as an editor for Kunstpunt, I regularly visited exhibitions in Minerva and every time I was there, I was amazed by what I saw, so I knew that these students really had amazing skills! And because many BCN researchers are young as well, wouldn't it be fun to ask the art students

The beauty of art is that one image can convey so many things very clearly.

to make the art for us? They have a very open mind and can put their own twist on things. With Sander Martens and Dagmar den Boer we had a real dream team for this. Fortunately, Academy Minerva was very enthusiastic and they were happy to collaborate on this.

How did you get from this idea to the artworks?

First we had to get all the brain facts. At BCN events and via email, we asked researchers from BCN to share their results or important findings in their field. Everyone could send something in, as long as it was brain research from Groningen.

With that list, we went to the Art Academy and literally sat down in a classroom and put the list on the table. Different classes of students got the facts and were assigned to make artwork for it. These were students who were taking courses in mostly graphical design and illustration, but some had a background in painting or photography as well.

What was interesting to see, was that some brain facts we thought were super fun, artists found very difficult because they had too many elements and were too complex. While with other facts we were actually not so sure about, the artists immediately had an image in mind.

What kind of BCN brain facts do you have?

The facts are all about human brains. Some are about how much human brains look like those of other animals. Others are about differences in men and women brains, or about how the left hemisphere works differently than the right hemisphere. We also have facts on treatments, such

as electric convulsion therapy or psychedelics. We try to cover a very broad spectrum of BCN research!

How did the students make the artworks?

Each artist had a unique approach. You have to imagine, we were sitting in the classroom and telling them the brain facts, and then some of them immediately started sketching. They associated the brain fact with visuals and drew things on paper right away. Others took their paper notebook from their bags and worked with paper and pencil and only later digitalized it. Some made hundreds of different sketches, while others immediately had a good concrete idea that was then developed further.

One of them broke a wine bottle, took pictures of every part of that bottle and made it whole again digitally. There is a person who drew only small details on those tiny A5 papers and scanned them in and pasted them together in Photoshop. Some artists even made great animations or stop motions.

Then there was a part of the artists that actually worked like scientists. They got a fact, and the first thing they did was open their laptop and immediately started their research: delving into the topic, and reading the scientific articles. When we would meet the artists after a few weeks, they seemed actual experts on the topic and knew exactly what a therapy looked like, what a radioactive tracer was, or what a brain surgery looked like. We initially thought that the brain facts might be difficult to understand and the literature pretty dry and tough to read, but no. A lot of them had no trouble with it at all. So scientists and artists work more similarly than you might think.

People need to know what kind of amazing research is being done here.

What do you enjoy the most about this project?

Personally, I really enjoyed the moments when I was sitting in class with the artists because you just had absolutely no idea of what they would come up with and then they showed the most amazing things. And seeing the BCN research you're so familiar with turned into an artwork was very special. I was there with Sander Martens or with Dagmar den Boer in the classrooms and the artists were showing their work, while we were sitting there with our mouths wide open from amazement at what had been created.

What makes this project unique?

I don't think there have ever been this many artworks made of BCN brain research in Groningen. Our idea was very simple; every week a brain fact with an art piece, which adds up to about 50 artworks. A very simple idea, but in reality 50 art pieces is a lot. So I think it is unique that we really put brain research in art on such a large scale, that hasn't happened before in Groningen.

Why do you think it's important that people discover this project?

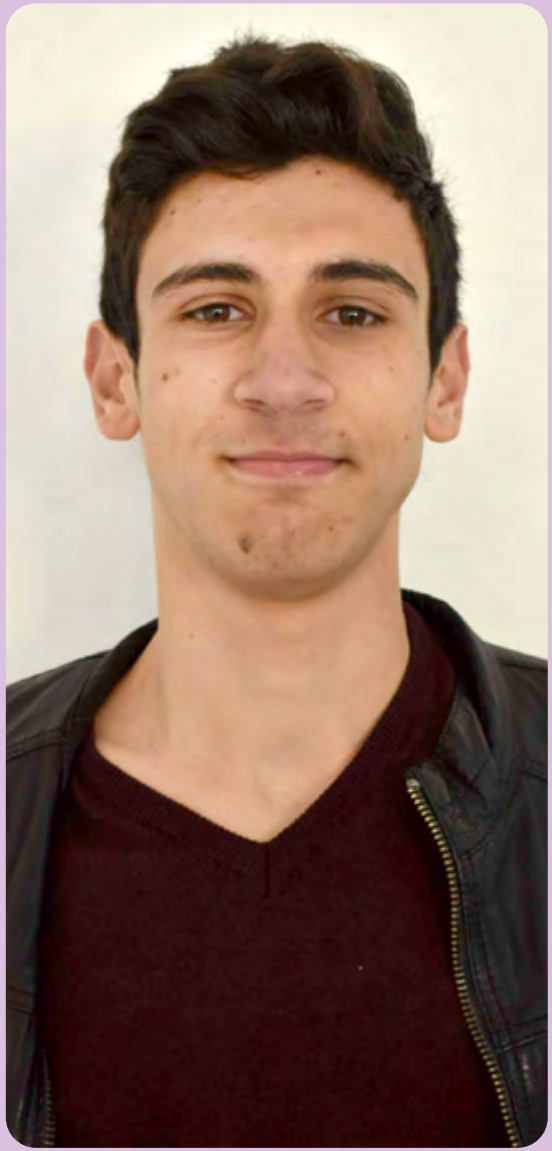
People need to know what kind of amazing research is being done here. Also, there are facts about mental disorders, and I hope that by spreading this information in an accessible way, we can remove a bit of the stigma surrounding them. As a brain researcher, I am amazed by what our brain can do, and if we can convey a little bit of this fascination to others, that would be wonderful.

Thank you Franciska for this interview!

Have you become interested in Science on Wednesday? Make sure to check out their Twitter, LinkedIn, Instagram and Facebook pages, where every Wednesday an artwork and a fact will be posted. In the following BCN magazine editions, a selection of artworks will be shared as well. If you have any questions, feel free to send an email to wetenschapopwoensdag@gmail.com.

- **BY MARY-ANN VAN DER LINDEN**
- **PICTURE BY MARY-ANN VAN DER LINDEN**

BCN MASTER STUDENT COLUMN



Hi there!

My name is Daniel Grech and I'm Maltese. I am a first-year BCN student in the C-track and I am currently doing my Minor Thesis project. I would like to share my journey, research interests, and passions that drive my pursuits.

I obtained a Bachelor's degree in Artificial Intelligence since I wanted to be at the cutting edge of technology development. However, as I learnt more about this subject, I became fascinated with cognitive science and wanted to learn more about the brain and mind. This led me to apply to the BCN master's program – particularly the C-track which focuses on cognitive neuroscience and computational modelling. In my Minor Thesis project, I work with Molecular Dynamics simulations. Here, I run computer simulations to model the interactions of atoms within different proteins which can help us gain novel insights into the molecular mechanisms at play in neurodegenerative diseases. Having almost no prior knowledge in molecular biology, this was a perfect project for me since I could dive into something new, while having a familiar footing in the computational process.

Beyond my studies, I have a passion for music, particularly jazz and funk, and I enjoy visiting the various bars in Groningen that feature live performances. I also love the natural environment around Groningen and occasionally take long bike rides around the countryside. Biking in the Netherlands is particularly enjoyable due to the flat terrain, unlike the hilly landscape back in my home country of Malta. In addition to these activities, I'm always interested in learning about new ideas in science and I try to stay up-to-date with the latest research. I'm particularly fascinated by the study of consciousness and how our brains give rise to a subjective experience. Furthermore, I find it interesting how our "normal" state of consciousness can be altered using compounds such as psychedelics or practices such as meditation, and I believe that these altered states can help us understand the nature of consciousness.

After my Masters, I wish to explore the field of consciousness further, possibly through a PhD although I am open to any opportunity that may arise. I believe in the importance of a multidisciplinary approach to science and I'm eager to continue my learning journey, possibly expanding my knowledge to other scientific disciplines. Ultimately, I am excited about the future and look forward to the new knowledge and experiences that await.

- BY DANIEL GRECH
- PHOTO BY ME (DANIEL GRECH)

Why a fitting supervisor should be the #1 priority in your job/PhD search

Imagine repeating an experiment for the fourth time. The first attempt failed because of an oversight (oops, but understandable). The second yielded no result in your positive control, the third was inconclusive and now, during attempt #4 ... an unforeseen power outage sabotaged your efforts. Frustrating, right?! Every PhD candidate needs to (learn to) be resilient, but paramount in the tumultuous journey that is a PhD trajectory is a supportive supervisor.

Reflecting on my own journey and supervisors... I was part of the B-track of the BCN master from 2017-2109. In my first internship, I embarked on an unconventional collaboration between the labs of Jean-Christophe Billeter (fruit flies) and Eddy van der Zee (mice). None of my experiments produced the expected results, but this common scientific situation was no hardship thanks to the professors' fearless support of my unconventional ideas. My second internship took me to Atlanta, USA, where I worked on AAV-CRISPR in prairie voles under the guidance of post-doc Arjen Boender in the lab of professor Larry Young. Larry, who sadly passed away recently, was an amazing science communicator whose mentorship was characterized by trust. Arjen's patience and kindness were invaluable, and one of the main lessons I took from him was that reproducible results are even more trustworthy if they hold in a disorganized environment. Another characteristic that speaks for him was his openness to the intern's organizational efforts.

While starting my PhD search, I joined one of BCN's great teachers, Anton Scheurink, in coordinating the neuroscience minor. Besides greatly enjoying Anton's passionate teaching, Anton taught me a lot about pragmatic project management ("Sometimes it's better to apologize afterwards than to ask for permission beforehand"). While working with the loving colleagues and supervisors at the secretariat of University College Groningen, a grant application with Jean-Christophe Billeter unfortunately did not work out. However, JC's (once again) unwavering support immediately pointed me to the funded project of another fruit fly Prof, and he put in a good word for me. This is how I ended up in the lab of Annette Schenck in Nijmegen. Before being offered and accepting the position, I reiterated for myself what my supervision needs are: a scientific inspirator who trusts me, independence, and a sparring partner who does not need to be the best organizer (as I can arrange that for myself). And most importantly: a supervisor who has my best interests as a person – not just as an employee – at heart. After multiple long phone calls with Annette and having spoken to three people in her lab, we all believed that the match was there. Even though Er Niks Boven Groningen Gaat, I never regretted moving to Nijmegen and teaming up with Annette.

> *"The key is that you should be aware of your supervision needs and find a supervisor that resonates with you"*

My journey underscores a crucial piece of advice passed on by Arjen: prioritize supervision! I have unfortunately seen lacking supervisor-supervisee connections around me and these PhD students, despite loving their research topic, really struggle in challenging times. Good supervision looks different for everybody. After the disappointment of experiment #4, what support would

you need? Kind words? Encouragement? It can also be that you can handle yourself perfectly fine and have no need for emotional supervision (kudos for getting this far into this column). Then all you might need is a reminder of your upcoming deadline of a paper-driven PI to help you push yourself again. All are fine. But the key is that you should be aware of your supervision needs and find a supervisor that resonates with you.

So think back to previous internships or jobs to determine in what kind of environment you thrive. Do you enjoy freedom or close guidance and teamwork? Does your spirit get lifted by gentle encouragement or by a kick up your ass? Ideally you'd have a pre-existing connection with your supervisor, but this isn't always feasible. So how do you assess compatibility?

"A happy scientist is a good scientist"

Gather information!

- Interview your prospective supervisor. Inquire about their leadership style, expectations, communication preferences. And very practically, ask how often and for how long they meet one on one with their group members. For reference: for me biweekly 1.5h meetings work really well.
- Reach out to current and former lab members. Don't just ask whether the supervision was good, but ask to describe the supervisor. Or ask them to describe a person that would match with the supervisor.
- Tap into your network. Contact individuals from outside the lab but from the same department for unbiased perspectives.

"Sometimes it's better to apologize afterwards than to ask for permission beforehand"

The last thing I want to leave here is that it is okay to quit your PhD if you are unhappy in your position. A happy scientist is a good scientist. And I sincerely believe that any sensible person that you interview with next will find that deciding to quit to prioritize your mental health is only reflective of a very professional attitude. I wish all PhD candidates endless signal in your positive controls and amazing resonance with your supervisors. I hope that you adopt this wish and make it come true!

- **BY MARINA BOON**
- **PHOTO BY ADITHYA SARMA**

Charting New Paths in Science and Beyond

The BCN Alumni Event, held on the 3rd of May at Het Oog in Linnaeusborg, featured several speakers who shared their career journeys after earning their BCN Master's degrees.

Josien Janssen gave the first talk, describing her career as a research technician and bird trainer. After struggling to secure a PhD position, she managed to get a job as a biotechnician where she gained many skills working with laboratory animals. However, she eventually wanted to continue learning different things and this is when she applied for a job as a research technician in biomimetics. Here, she explores the dynamics of bird flight; applying it in diverse use cases. Janssen expressed her passion for learning, her resolve in overcoming obstacles and an alternative route to a research career outside the traditional PhD path.

Although the second speaker, Rutger Boesjes, was unable to attend, his presentation was delivered by Kris Vasse. Boesjes addressed key questions he faced while pursuing a career, emphasizing the importance of using your time and ideas on projects that truly resonate with you rather than accepting the first opportunity that comes along. He also noted that while your research projects during your degree may give direction to what you do after graduation, this is not necessarily the case, and you can consider summer- or winter-schools to add experience. Finally, he highlighted the importance of having a good relationship with your colleagues, and in the context of a PhD, effective communication with your supervisor.

Hedwig Doornbosch shared her unconventional journey to becoming an air quality advisor. Despite starting off with a clear vision of pursuing a PhD, she changed her mind after a difficult experience with her Major Thesis Project. During the pandemic, she found herself jobless, and while it was not an easy time, she had the space to reflect on her qualities and interests. This is when she realised that she wanted a job as an advisor, and after an extensive job search, she secured a position as an air quality advisor. Through her story, Doornbosch illustrated how challenging experiences can help us to grow and highlighted the importance of staying open to possibilities we may not have initially considered, ultimately leading to unexpected and rewarding opportunities.

After the break, Charlotte Lunsingh Scheurleer, a former B-track student, showed us her career path that led into working in a Digital Agency. During the BCN Research Master, she completed her Minor Research Project about dopamine in Major Depressive Disorder. After that, she did her Major Project with Philips Research, where she researched the influence of sleep behavior awareness on the flexibility to change the circadian clock with Marijke Gordijn. After that, she worked as a Research Scientist at Philips Research regarding consumer health in sleep and stress. She applied for a PhD but instead of that was offered the opportunity to complete an Engineering Doctorate (EngD), a 2-year program combining academia and business at the Eindhoven University of Technology and Phillips. After obtaining an EngD, she worked at Capgemini as a User Experience consultant involved in digital product strategy, design, and research. This has led to working at iO Digital, on a digital product strategy focused on customer experience. The talk was concluded with helpful tips for younger students on choosing their careers and appreciating their experience and skills.

Charlotte's talk was followed by Laurent Krook, current e-learning advisor at the University of Groningen. As a person experienced in teaching, but also a former BCN Student, he could answer all of the students' questions in a very proper and understandable way. After completing his Minor Project using EEG to monitor different brain reactions to different brands, he went on to complete

his Major Project, during which he recreated various cognitive task batteries using OpenSesame. The project and idea were so successful that he decided to create a start-up based on it. He was developing a technology to provide a template for other researchers to work on. While working on a start-up, he took up a part-time job as a teacher at the RUG. During that time, he accidentally got involved in e-learning. This turned out to be really helpful in 2020 when the pandemic hit. Suddenly, many teachers needed help with conducting classes online, because most of them had never done it before. Now, Laurent is working full-time in e-learning. His talk was concluded with some nice questions from the students and with various tips from Laurent about career, development, and the importance of your own well-being.

The second part ended with drinks and snacks. This was followed by a dinner at Uurwerker, which pleasantly closed the entire event. The speakers presented a variety of career paths available after earning a BCN Master's degree. Their experiences demonstrated how to overcome challenges and pursue career opportunities beyond the traditional academic path.

- BY DANIEL GRECH & MAŁGORZATA (MARGOT) TYBUSZEWSKA
- PHOTOS BY MAŁGORZATA (MARGOT) TYBUSZEWSKA

Learning Language from Your Television

It's Saturday night. With a cup of tea and a blanket, you settle into the couch to watch an episode of La Casa de Papel. For a week, you have been watching one episode a day to wind down after a long day of work. While watching tonight's episode, you notice something odd. You didn't know any Spanish when you started the first episode. Yet, now, after a week, you no longer need the subtitles to understand that "vale" means "okay"... Could a television programme really teach you a new language? That is exactly what Anastasia Pattemore is interested in. She is a postdoc at the Faculty of Arts, where she investigates the role of subtitles in language learning. BCN Magazine talked to her about her PhD, her postdoc, and her views on the use of captions and subtitles to learn a foreign language.

Dubbing and captions

In her academic career, Anastasia has investigated different types of audiovisual input. Her first studies date back to 2018, when she started a PhD in Applied Linguistics at the University of Barcelona. Her PhD was part of a larger project on language learning from subtitles and captions. In Spain, most foreign movies and television programmes are dubbed: instead of showing foreign language programmes in the original language, the original audio is replaced by a translated version in Spanish. The leader of the research project, Prof Carmen Muñoz, hoped to encourage the Spanish government to provide more non-dubbed versions of foreign television programmes: that way, Spanish viewers would have more opportunities to engage with English.

In her PhD, Anastasia focused specifically on the potential of captions for learning grammatical constructions in English. Captions are onscreen transcriptions of the audio, presented simultaneously with the corresponding sounds. As they are transcriptions, they are written in the original language of the video. This distinguishes captions from subtitles, which are written translations into a different language. Anastasia tested two groups of participants, one group who watched English videos without captions and one group who watched with captions. She found that both participant groups learned English constructions by

"Something about captions appears to compensate for limited working memory capacity"

simply being exposed to the English videos. However, the group with captions showed larger gains, suggesting that simultaneously hearing and reading a language supports learning.

Interestingly, the effect of captions was not equally strong for everyone: participants with a poorer working memory benefited more from captions than participants with a better working memory. Something about captions appears to compensate for limited working memory capacity. "There is a subtitle principle, meaning that captions provide an opportunity to revisit what you've heard", Anastasia explains. "So if you've missed something or if you need to repeat what you heard, you always have this opportunity to double check what was said." This extra check seems particularly useful for those of us who need a bit of extra help.

Learning via subtitles

In her postdoc, Anastasia has shifted her focus to subtitles. Specifically, she analyses if newcomers to the Netherlands, such as refugees, can learn word combinations from plurilingual audiovisual input, if they watch a series in English, their second language, and

"Difficulty in retrieving information actually supports our learning"

read subtitles in Dutch, their third language. Anastasia developed this idea during a research stay in Belgium, where many movies are shown in English with Dutch or French subtitles. Being exposed to subtitles in an unfamiliar language, she started to wonder if someone could learn a new language from this type of input.

In the context of the Netherlands, this is a particularly interesting question. For newcomers to the Netherlands, learning Dutch is important for civil integration and for improving your chances of finding a job. Yet, while they are learning Dutch, they often notice that their English skills deteriorate. And while "Dutch, of course, is important" when living in the Netherlands, newcomers "still need English to some extent": many organisations look for employees with well-developed skills in Dutch and English, and English is often used as the language of instruction in Dutch higher education. By watching English series with Dutch subtitles, newcomers might kill two birds with one stone: it could help them learn Dutch, but also ensure that their level of English stays up to par.

The preliminary results of the project indicate that the participants indeed learn Dutch constructions by watching an English television series with Dutch subtitles. Their knowledge of English, however, did not improve but remained stable. As Anastasia explains, the different outcomes for Dutch and English could be related to the kind of 'help' the participants received during learning. The learning of Dutch constructions was not only supported by what was happening in the video, but also by the audio in English, a language the participants were more familiar with. Their (partial) understanding of words or phrases in the English audio might have helped them uncover the meaning of the Dutch subtitles. In contrast, participants could probably not use the Dutch subtitles to discover the meaning of English words in the audio as their Dutch proficiency was low. The eye-tracking data collected during the project could give more insight into the participants' learning process: the amount of time they focused on the visuals and subtitles could indicate how deeply they processed them.

In one of her other projects, Anastasia also wanted to establish the ideal amount of time between viewings: do you learn more if you watch several episodes in one go or if you limit yourself to one episode per day or week? She divided her participants into three groups to investigate this question: binge watching, watching once per day, or watching once per week. The results indicated that it was more beneficial to watch only one episode per week. According to Anastasia, this could be due to various reasons, including the effect that sleep has on memory: "with sleep consolidation, we retrieve information maybe not as easily as [when] we're just presented with that information. And this difficulty in retrieving information actually supports our learning because we make an effort to remember what the word was".

Language learning in practice

Thus, binge watching might not be the best way to go. Does she have any other tips for those of us who want to learn a new language via foreign television? Should we use subtitles or captions for optimal learning? Anastasia's advice depends on the language level you already have. Did you just start learning a new language? Then it would be best to use subtitles, either in your first language or in another language you know well. Are you already an intermediate user (A2+ or B1, for those of us who are familiar with CEFR)? In that case, you are probably ready to watch with captions.

As she is currently learning Dutch, Anastasia can test herself how well subtitles help her in the initial stages of second language learning. A couple of weeks ago, she watched the movie Dune with Dutch subtitles. Although the movie only lasted a few hours, it already had an effect: "I could notice that there are more [Dutch] words now that I notice, that I can connect". However, watching your favourite movies or tv series with subtitles will not work wonders. "Television is just one type of exposure, and it's a very passive one. And we know that for language to be acquired and to improve, you need interaction". As comfortable as it might be, staying on the couch to watch a television series will probably not make you fluent. If you really want to learn a new language, you have to get up and talk to people.

- BY PENNY HEISTERKAMP
- PHOTO BY MATTHEW PATTEMORE

BOOK REVIEW

‘Girl, Interrupted’ by Susanna Kaysen

Girl, Interrupted by Susanna Kaysen is an autobiography about her experiences when she was admitted to McLean Hospital, a psychiatric hospital, at 18 years old in 1967, with a diagnosis of Borderline Personality Disorder. The story goes through her experience of being admitted and her daily life in the facility and includes Susanna’s thoughts about mental health and what it means to be sane. Actual documents from her time at the hospital are included in the book, giving an intimate look into her time there.

Review

The book is inherently full of heavy emotions, as it touches upon topics of depression, self-harm, and suicide, to name a few. However, the writing style is somewhat detached. Emotions that Susanna may have felt in a particular moment were not described, only the actions of the moment itself. In the preface, Susanna clarifies that she wanted to write like an anthropologist to explore the intricacies of life in the McLean hospital. Interestingly, this detached writing style draws the reader in and allows them to fill in the gaps themselves, making the story relatable to them.

The line between normal and abnormal, sane and insane, is also explored in the book. Susanna wonders whether she was truly insane or if she only got that label because she did not fit the standards of society. Did she really have borderline personality disorder, or was she just a teen living a tumultuous life? What does it really mean to be sane? In her eyes, her past suicide attempt was a way of catharsis, of killing something inside of her that had been eating away at her. In fact, she felt good after the attempt. An interesting moment in the book is when Susanna is worried about not having bones in her hand, and she scratches herself open to find her bones; when the nurses help her, she only feels a sense of relief; she is now truly insane and she now truly belongs in the hospital.

She also touches on the stigma surrounding people who have been diagnosed with mental illnesses or who have been admitted to psychiatric hospitals. For example, how difficult it is to find a job while she is still hospitalized because all her potential employers recognise the hospital’s address. She even acknowledges having grown to stigmatise them herself. Additionally, she discusses the sometimes unfair treatment of those with a psychiatric disorder in the 1960s, and often conveys her pain of being stuck in the hospital with her life on hold while other teens were out enjoying their lives.

Conclusion

While the story takes place in the late 1960s, many of the topics are still relevant today. For example, the line between sanity and insanity remains somewhat blurry. I personally wonder where this boundary lies, and how we as professionals and researchers can try to elucidate this line.

An important topic in this book is the dichotomy between treating the mind and the brain. It is important for those researching the mind and those researching the brain to communicate with each other to truly understand the processes underlying mental disorders. As a part of this, it is also important to consider the experiences of the patients themselves. As researchers, I feel like we sometimes forget the personal side of the patients we come in contact with. It might be best for us to distance ourselves from their personal stories to make sure we don’t get hurt by what they’re going through, but in the end, patients are people with their own intricate stories, and we must not forget that. By listening to their stories, we can come to new insights and consider things we may not have considered before. To research a disorder, it is essential to understand it, not just from papers but also from personal accounts of the people suffering from the disorders we research.

All in all, Girl, Interrupted by Susanna Kayes is a very touching personal account of a young girl diagnosed with Borderline Personality Disorder in a psychiatric hospital. The story is hard-hitting and deals with heavy topics but is also paired with humorous moments, making it a great read. I would definitely recommend reading it if you want to dive into all sorts of questions surrounding mental health or if you are curious about patients’ perspectives!

● BY MARY-ANN VAN DER LINDEN

Neuroanatomy Lessons powered by MemoryLab

I'll start with something we all know: Modern research in the fields of neuroscience and cognitive science is pushing the boundaries of human knowledge faster than ever. It goes without saying that these fields play a crucial role in advancing modern life by contributing to healthcare, artificial intelligence, and education, among many other areas. People involved in the BCN programme probably already have a good sense of this reality, considering all the research and developments they have to keep up with.

In addition to the sheer impact and relevance of these fields, my generation is also growing up alongside the rapid advancement of AI. (I'm sorry, but it's really hard not to make everything about AI these days.) You can imagine, then, how an interest and curiosity in the nature of intelligence and 'the mind' is basically instilled from birth, leading many young people (and probably more than ever) to pursue studies in these fields.

This article is the story about a little project that is supposed to help these people on their way.

For students embarking on the academic odyssey into neuroscience, the journey is as challenging as it is rewarding. Even without AI as a backdrop, there exists a deep interest in learning about cognition and its scientific basis. But in order to get there, understanding the intricate structure and function of the brain is crucial and requires a solid grasp of the terminology and concepts. So, we dive into a world of anatomical information and terms and hope to surf the tides of knowledge without any effort. But for many students, including me, this dive is more like a push into the cold water, and soon we fear drowning in the ocean. But I don't think we need to, and thankfully I'm not alone.

The Creation of the BrainTrainer

Enter: MemoryLab. Company founder and senior lecturer Hedderik van Rijn, together with colleague Marie-José van Tol, assembled an A-team of professors and researchers who decided to try and ease the pain of aspiring neuroscientists: Jocelien Olivier, Jean-Christophe Billeter, and Janniko Georgiadis: They all teach at the UG and are familiar with the barrage of terms and structures that students are asked to learn in order to pass their exams. They brainstormed a vision of an online, open-access neuroanatomy study tool, with MemoryLab at its heart (but also its brain, I suppose). Two students were hired as teaching assistants and boom, the BrainTrainer was born.

Figure 1: BrainTrainer co-developers Remon (left) and Malte

Here's what we did: my coworker Remon (a kickass BCN Master student) and I, under the supervision of Hedderik and Marie-José, assembled a foundation of neuroanatomy facts that we thought every neuroscience/ biopsychology/ cognitive science student will have to learn at some point. This included facts on common structural components (lobes, nuclei, gyri, etc.), but also functional networks (e.g., for perception or motor control), and basic terminology (directions, locations, umbrella terms). We then created lessons on each of these groups, using the MemoryLab system to create items for each fact. Each of these items was designed with the intention to teach information about their structure, location, function, and meaning. On top of that, we're using open-source materials wherever possible. This poses quite a challenge when it comes to finding good images, especially for in-depth anatomical information. Fortunately, this also results in a diverse set of materials that help teach neuroscience facts independent of a fixed visual representation.

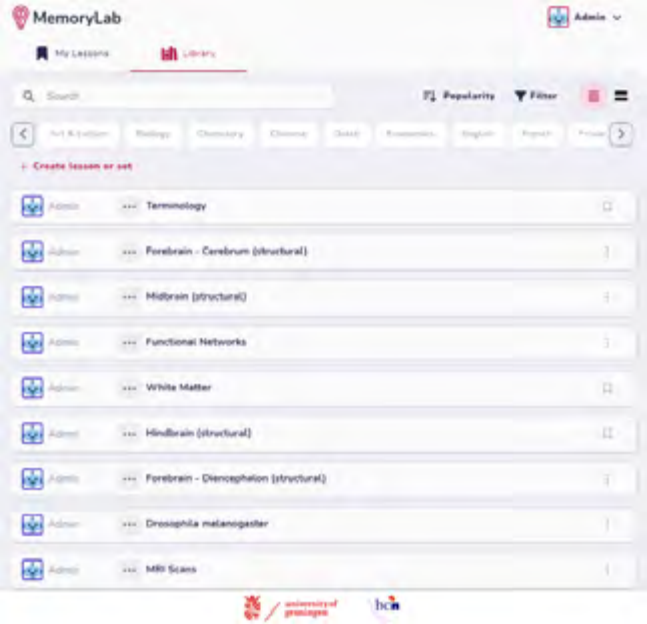


Figure 2: The current interface of the BrainTrainer's main page.

For students embarking on the academic odyssey into neuroscience, the journey is as challenging as it is rewarding. Even without AI as a backdrop, there exists a deep interest in learning about cognition and its scientific basis.

Working in this manner led to an initial basis of around 1500 items (~27 facts in each of the 55 lessons), teaching the aforementioned material with schematic images and descriptions, through open answer or multiple choice questions. And while this sounds like a lot (and it is!), we're nowhere near finished. New lessons on more in-depth brain structures, as well as other domains of neuroscience knowledge, are already underway. In addition to existing MRI and fruit fly lessons, other prospective content involves the rodent brain, brain slice imagery, and additional functional networks.

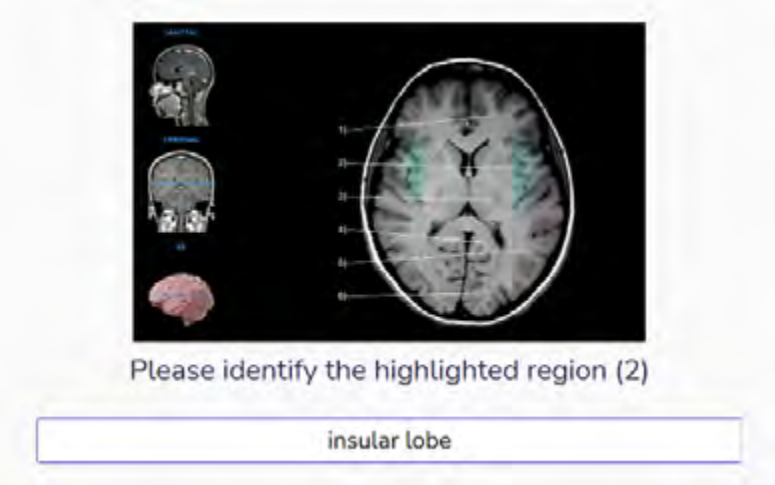


Figure 3: An example of an MRI lesson.

This is How it Works

As an example, if you were trying to learn about the anatomy of the forebrain, you can pick one of the corresponding sets (e.g., the one on the cerebrum) and then choose to study items in one of the lessons within the set. In this case, there are lessons on specific lobes, the limbic cortex, the cerebral nuclei, or simply the most important terms of the cerebrum. Most lessons can be studied through recognition (i.e., in multiple choice format), recall (where answers must be typed), or in reverse (where you must match an image or description to the item). This way, anatomy facts can be learned more thoroughly, and the learned information doesn't just go one-way.

While the BrainTrainer is intended to help students of all faculties study for their neuroscience exams, we want to reflect the interdisciplinary spirit of the BCN programme by including many different domains of knowledge. For example, there are already lessons including MRI scans of relevant brain structures, as well as lessons detailing the neuroanatomy of the drosophila melanogaster (the common fruit fly). Our hope is that, by teaching neuroscience from as many angles as possible, we can provide a comprehensive and multifaceted understanding of the brain and its functions to anyone willing to learn.

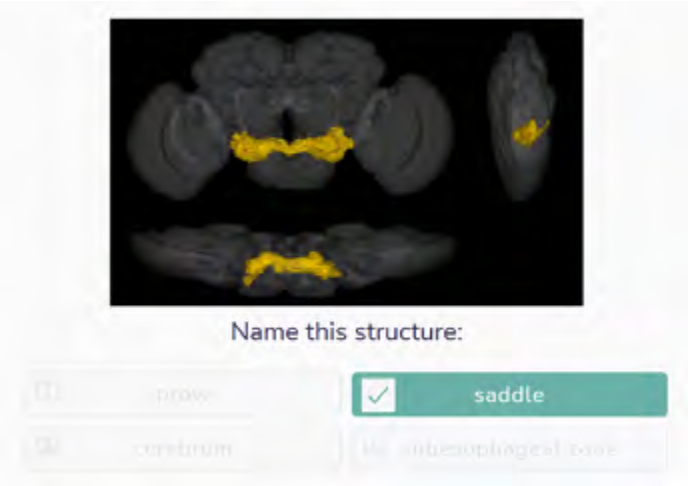


Figure 4: An example of a drosophila lesson.

Do Students Like it?

Initial tests of the BrainTrainer on unsuspecting fellow students showed great promise: People generally appreciate the interactive manner of the lessons, and the visual materials seemed to help, especially when studying new structures. Building on their feedback, we have already improved aspects of our initial design (for instance by clarifying visual cues), and added new lessons that should cater to their needs. Specifically, the basic terminology lessons are intended to lay the groundwork for understanding other terms, while functional and MRI lessons extend the basic structural and schematic information that most students are already familiar with. For the future, we aim to stay open for feedback to align the BrainTrainer to the needs of both students and teachers as much as possible.

In case you're interested, the BrainTrainer is free to access for anyone. It is hosted on a MemoryLab domain at braintrainer.memorylab.app and only requires the creation of a free account. New users can pick lessons from sets on each of the categories mentioned before, and study neuroanatomy facts for as long as they like.

In conclusion, I hope to inspire some optimism in you as a reader, regarding the academic future of all those biopsychology, neuroscience, cognitive science and other curious students out there. In the creation of the BrainTrainer, we are making our best effort in designing an accessible and comprehensive study tool for neuroanatomy facts, including knowledge from diverse domains and making it freely available to anyone who's interested. I encourage you to give it a shot, and share your thoughts with me or the team so that we can keep improving the learning experience we aim to provide.

- **BY MALTE KRAMBEER, BSC STUDENT PSYCHOLOGY**
- **FIGURES BY MALTE KRAMBEER**

Braintrainer MemoryLab | Personalised learning

MINDWISE

Mind, Body, Long COVID, and Statistics

Dutch media recently commented on a new publication by doctors and medical researchers from Amsterdam: "Long COVID has a physical cause." [1]. For the study in Nature Communications, Brent Appelman and colleagues compared 25 patients with the diagnosis "long COVID" (average age: 41 years) with a control group of 21 healthy people [2]. In both groups, almost 100 percent of the participants has been vaccinated against COVID. To quantify the patients' impairment, the researchers assessed their capacity to work: that severely decreased from 36 hours on average before the disease to only five when participating in the study.

As reviewed by Sandra Lopez-Leon and colleagues in 2021, more than 50 symptoms have been reported as long-term effects of a COVID-19 infection [3]. The most common are fatigue (56 percent), headache (44 percent), attention problems (27 percent), hair loss (25 percent), dyspnea (shortness of breath; 24 percent), and anosmia (loss of smell; 21 percent). More psychological problems have been reported, too, such as memory loss (16 percent), anxiety (13 percent), depression (12 percent), and a sleeping disorder (11 percent).

Cycling for science

For the new study, Appelman and colleagues focused on fatigue, or more specifically, limited exercise tolerance and post-exertional-malaise. This does not only mean that patients have less capacity for physical exercise, but that they also remain more tired for longer – or that their state even gets even worse after the activity. This is also relevant for treatment, as many long COVID patients are offered physical exercise to (allegedly) improve their well-being.

To assess this under controlled conditions, all participants performed a cycling task. The researchers then recorded several health-related measures. One of their central findings is that the patient group had significantly more amyloid deposits, a kind of protein, in their muscle tissue already before, but even more so one day after the exercise (see figure).

This is obviously a clinically important finding and suggests follow-up research: Can the deposits be prevented or broken down medically? And, if so, will that reduce the patients' fatigue?

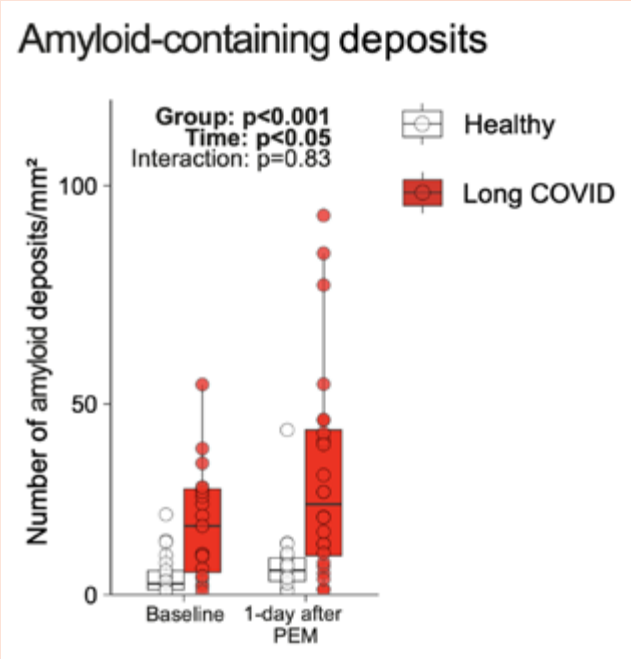


Figure: Participants with a diagnosis of long COVID (red) had significantly more amyloid deposits in their muscle tissue, particularly a day after the exercise. Source Appelman et al., 2024 [https://www.nature.com/articles/s41467-023-44432-3]. License: CC BY 4.0 DEED [https://creativecommons.org/licenses/by/4.0/]

"Just between the ears"

More research has thus to be done. But we can still discuss some important questions, also related to what we teach our psychology students in statistics classes: First of all, as the researchers report (but the journalist gets wrong), the finding is only a statistical correlation and not yet a proven causal link; the follow-up research mentioned above could clarify this point.

Secondly, the accumulation of deposits was increased in (roughly) half of the patients. As we can see in the figure, there is much overlap between the patients (red) and the control group (white). This strongly suggests that the proteins, if they are causally relevant at all, aren't the cause of fatigue in all patients. The media report thus looks premature, if not exaggerated.

A third and particularly psychologically relevant point is, in my view, that this biomarker (the amyloid deposits and some other but similar findings reported in the study) would prove that the patients' problems are somehow "more real", or, to use a common Dutch idiom: "not just between the ears".

Well, what is it that we have between our ears? The heads, our brains, are thus the arguably most central and important part of our nervous system. And this, in turn, is essential for our psychological life and well-being.

Psychology is real

Indeed, probably ever since we talk about psychological problems or symptoms, people who suffer from them experienced pressure and/or difficulty that their suffering, that their impairment is real; or in other words: that they're not just lazy or simulating.

I've just been reading related literature from the early 20th century. At that time, several countries (e.g., Germany or Great Britain) had introduced welfare institutions like various kinds of insurance for laborers. Sometimes, for example, personnel working on trains – which traveled slower back then, around 50 to 80 kilometers per hour only, but derailed or collided more frequently – would have a demonstrable physical injury after an accident; but sometimes the symptoms would be primarily psychologically, similar, arguably, to what we nowadays would call post-traumatic stress.

However, doctors who took psychological symptoms less seriously would ridicule the patients' condition as "retirement neurosis". That is, they would consider them as malingerers who fake the symptoms to receive public benefits.

When I now read in the year 2024 in the news that the patients' representative is happy that the new study once and for all proved that long COVID is real, I must sigh. Because this unfortunately still communicates the idea that psychological symptoms are "less real".

Imagine two cases

Why not turn that kind of reasoning around: Firstly, imagine that you had an organic condition, but no impairment or suffering; or, secondly, imagine that you had no organic condition, but a severely depressive mood. Which of the two cases seems worse? And how could someone call severe depression "less real" or "just between the ears"?

Of course, some consider depression (and other disorders) simply a "disorder of the brain". We could understand this in the sense that all of our psychology is somehow related to the activity of our nervous systems. But it is, generally, still not possible to just look at a brain scan and then diagnose the patient's mental health problem (see also [4] Schleim, 2022).

Thus, for the time being, there is no "objective" biological proof of psychological suffering, although psychiatrists have been looking for it for more than 170 years. Still spreading the "psychological problems are less real" narrative, whether intentionally or not, may thus cause trouble for those suffering from them.

And just as some psychological problems justify a medical check-up – for example, thyroid dysfunction may cause a depressive mood –, it may sometimes be warranted to screen for psychological problems if a patient's problem cannot be explained organically. But that's, probably, something those who consider psychology as "just between one's ears" don't want to hear.

● BY STEPHAN SCHLEIM

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Title image: Gerd Altmann on Pixabay

References

1. https://nos.nl/artikel/2503701-long-covid-is-lichamelijk-en-zit-niet-tussen-de-oren-toont-onderzoek-aan
2. Appelman et al. (2024). Muscle abnormalities worsen after post-exertional malaise in long COVID. Nature Communications, 15, 17. [https://www.nature.com/articles/s41467-023-44432-3]
3. Lopez-Leon et al. (2021). More than 50 long-term effects of COVID-19: a systematic review and meta-analysis. Scientific Reports, 11, 16144. [https://www.nature.com/articles/s41598-021-95565-8]
4. Schleim (2022). Why mental disorders are brain disorders. And why they are not: ADHD and the challenges of heterogeneity and reification. Frontiers in Psychiatry, 13, 943049. [https://www.frontiersin.org/articles/10.3389/fpsyt.2022.943049/full]

About the author

Dr Stephan Schleim is Associate Professor of Theory and History of Psychology at the RUG Psychology Department. He studied philosophy, psychology, and computer science and has a PhD in Cognitive Science (2009; University of Osnabrück, Germany). His dissertation was awarded the Barbara-Wengeler-Prize for interdisciplinary research in philosophy and neuroscience (2010; EUR 10,000). He joined the Theory and History of Psychology group at the RUG Psychology Department in 2009.

Stephan is also a public commentator on discoveries in the neurosciences, particularly their social/ethical implications, and an experienced speaker at academic, governmental, and societal institutions. He has worked as a public science writer since 2004.

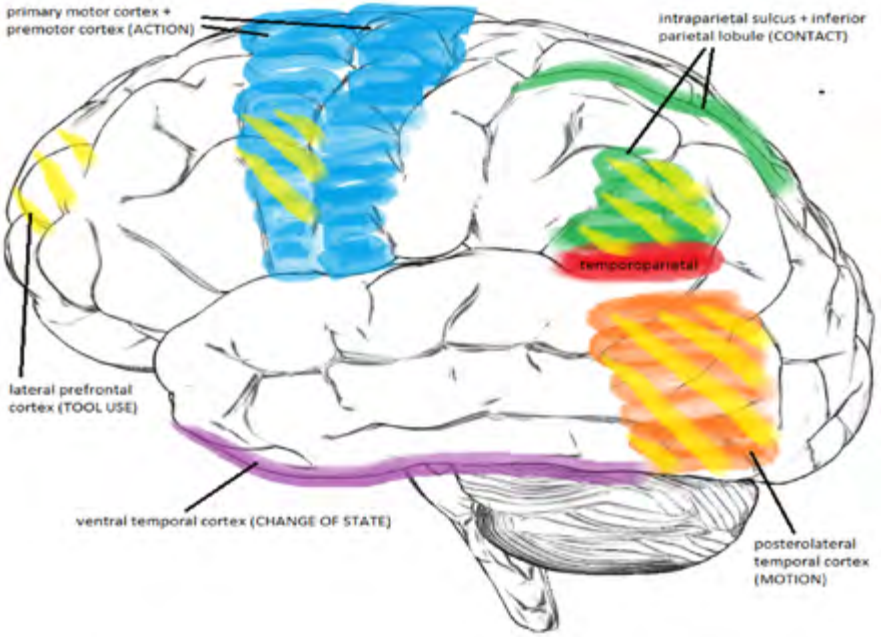
His major research interests are the theory and communication of neuroscience as well as the philosophy and future of psychology.

It's all about the verb

Verbs constitute an important part of the sentences we produce. Although verbs are sometimes found in the shadow of nouns, prof. dr. Roel Jonkers has put verbs in the spotlight by presenting years of research in his BCN Lunch Lecture on the 6th of June 2024, titled 'It's all about the verb. The importance of studying verb processing in adults and children with language disorders'.

Verbs in a sentence

Prof. dr. Jonkers started by explaining that verbs store a lot of information. They convey meaning in a sentence, but verbs also perform the duty of 'inflection': verbs can be altered to change grammatical meaning. To show time, for instance: *I walk, I walked and I am going to walk* indicate when you have been walking. Moreover, verbs always need an actor ('the argument') to perform the action.



Clinical studies

With this in mind, we dived into verb research: the first reports of verb retrieval problems already date back from the mid-1700s. However, the first clinical studies took over 200 years to emerge. These studies compared patients with Broca's aphasia (syntactic deficits with problems in action (verb) naming) to patients with anomic aphasia (semantic deficits with object (noun) naming). Yet, these studies also mark a period of contradictory outcomes, as conflicting patterns of impairments in action and object naming were found in these patient groups.

Verbs come in different types

So, how come results from well-designed studies differ so much? In his PhD, prof. dr. Jonkers looked into this matter and investigated a possible reason for these contradictory results: Verbs do not form a uniform category, but consist of many – over 250 – different types. Focusing on different verb types and examining the effects of verb type on action naming could therefore explain these results.

Transitivity and instrumentality

Prof. dr. Jonkers focused on two aspects of verbs in his lecture: transitivity and instrumentality (see box 1). Patients with Broca's aphasia perform worse on intransitive verbs than patients with anomic aphasia, perhaps due to the association with an object in transitive verbs. In contrast to transitivity, patients with anomic aphasia performed worse than patients with Broca's aphasia on non-instrumental verbs – probably because they profit from the lexical representations of the objects that are present in these verbs and are missing in non-instrumental verbs.

Verbs do not form a uniform category, but consist of many – over 250 – different types.

Verbs in neurodegenerative diseases

Verb retrieval has also been investigated in Alzheimer's disease and Primary Progressive Aphasia (PPA), but not concerning verb type. Interestingly, impairments in instrumentality flip as Alzheimer's disease progresses. Patients perform worse on non-instrumental verbs in early Alzheimer's disease and worse on instrumental verbs in late Alzheimer's disease. An explanation for these results is that information about instruments is gradually lost as the disease progresses, thereby hampering instrumental verb retrieval.

Language impairments are the first symptoms of PPA. Dr. Jet Vonk studied brain activation by verb categories in patients with PPA, in line with the concept of embodied cognition. Different brain regions are activated by particular verb categories, for example the primary motor cortex and premotor cortex by action verbs. However, no link was found between brain activation and verb categories even though patients with all forms of PPA performed worse on verb over noun retrieval in a lexical decision task. Hence, the effects of verb type do not always align with the underlying lesion and do not support embodied cognition.

Clinical implications

This research has both fundamental gains and clinical implications. Prof. dr. Jonkers found for example that videos portraying verbs work better than photos. These findings have been used in diagnostics and in therapy by developing the MOVE app for patients with aphasia. Furthermore, monitoring language and verbs in awake surgery helps to save more healthy tissue after tumor removal. Sometimes, not completely removing a tumor is preferred if the patient then keeps the ability to speak, increasing quality of life.
Last but not least, prof. dr. Jonkers provided a sneak peek for the next Lunch Lecture by Dr. Vânia Correia de Aguiar about children with developmental language disorders who also present with specific verb problems. For more about verbs, keep an eye on your mailbox for the next BCN Lunch Lecture!

- BY MARIE-CHRISTINE VAN DE GLIND
- PICTURE BY JET VONK

Box 1:
Transitivity and instrumentality are two examples of verb types.

Transitive verbs need both a subject and an object.

For example: the verb 'to grind' always needs an object, as you need to grind something, such as coffee.

Intransitive verbs do not require an object.

For example: the verb cycling only needs a subject, as you cannot cycle someone or something.

Instrumental verbs need an instrument to perform an action.

For example: you need a knife to cut an apple.

Name-relationships are connected to this, for example a saw for sawing.

This is linked to lexical representations, making it easier to retrieve the verb.

Non-instrumental verbs do not require an instrument for action.

Summer School on Psychedelic Research

This summer marked the third edition of the Summer School on Psychedelic Research. From July 8th to 12th, students from all over the world came to Groningen to learn about various aspects of psychedelic research.

The main focus of the summer school was clinical research. International and Dutch experts such as Robert Schoevers and Joost Breeksema elucidated the intricacies of what it means to perform clinical research and showed their own groundbreaking findings. Participants learned about multiple psychedelic substances, such as ketamine and LSD. There were also talks about scientific integrity and career prospects in psychedelic research. Other important aspects of psychedelics were discussed as well, such as psychedelics in religion and in history. All of this knowledge about research was put to use immediately, as participants created their own research projects and presented them as posters on the final day.

Besides opportunities to learn, the summer school also featured exciting social activities. The beloved Cacao Ceremony from the previous years returned, and as a new addition this year, there was a pub quiz on psychedelics. The summer school was end with social drinks on the final day, after the poster presentations.

All in all, the summer school provided participants with a good overview of the current state of the field, future career prospects, and a great opportunity to network with like-minded people. Are you curious about the summer school? There will be another edition next year. Be sure to follow the Instagram and LinkedIn pages for the latest updates!

- BY MARY-ANN VAN DER LINDEN
- PHOTOS BY JEROEN NEEF

BCN RETREAT 2024

On April 11th and 12th, 2024, the BCN PhD community gathered to focus on sharing their research without distractions from daily life. The BCN Retreat took place in the Hotel De Oringer Marke in Odoorn.

Day 1

One of the first presenters on the first day was Veera Ruuskane (Experimental Psychology). With her incredibly well-delivered presentation "Endogenous pupil size fluctuations and visual processing", she managed to catch the audience's attention. Her preliminary results have shown that we are able to tease apart the effects of cognitive factors and pupil size in near-threshold detection. These findings open exciting new avenues for future research, promising deeper insights into the intricate relationship between cognitive processes and pupil responses.

Mirjam Koster (Biomedical Sciences) shared her data on multiple sclerosis (MS). A lively discussion followed the presentation, where attendees were mostly interested in the change of cellular heterogeneity between MS and control CNS tissue, and between the different MS lesion types. "These little grey cells. It is up to them." The cells can always give us a surprise! Mirjam Koster was the first day winner of the "Best presentation award."

During the presentation, Karina Köpke (ERIBA, Biomedical Engineering, Medical Oncology) played second fiddle to Mirjam Koster, who gave a talk on "Investigating the role of extracellular matrix stiffness in glioblastoma in zebrafish." She investigates how extracellular matrix (ECM) stiffening influences Glioblastoma (GB) invasion and growth in a zebrafish xenotransplant model and examines the underlying mechanism. One of her preliminary results was that she could quantify GB cells and see a reduction in cell number within the first 24 hours after transplantation. Using fluorescent reporter zebrafish lines, they are able to determine the migration and fate of transplanted GB cells over time. "Real change, enduring change, happens one step at a time."

After the first coffee break, the session was kicked off by Gargi Ahuja (Groningen Institute for Evolutionary Life Sciences, GELIFES). She began with a compelling statement on the genetic architecture of Parkinson's Disease (PD), emphasizing the crucial role of Leucine-rich repeat kinase 2 (LRRK2) in its pathogenesis. Despite extensive research over the years, the cellular and pathological functions of LRRK2 remain elusive. Dictyostelium roco4 mutant strains were utilized to explore the function and regulation of Roco proteins and LRRK2 during infections to shed light on this. Their data revealed that phagocytosis is impaired in the absence of the roco4 gene, indicating that Roco4 plays a significant role in phagosomal processing and maturation.

The scientific program was accompanied by a social program. In the afternoon, people could participate in a Walk & Talk, a beautiful hike in the surroundings of Odoorn. The activities were followed by one hour of scientific speed dating. Every three minutes, people switched partners to talk about their research projects. Meanwhile, we had all grown hungry and thirsty and longed for dinner. After dinner, the evening was settled in the underground bowling center.

Day 2

The second day, Junfei Cao (GELIFES) started with her presentation about altered circadian function in a mouse model of Phenylketonuria (PKU). She assessed circadian activity patterns of PKU mice using passive infrared recording (PIR) sensors and found altered rest-active patterns and higher fragmentation in PKU mice. In addition, Electroencephalogram (EEG) was used to examine their wakefulness and sleep cycles, along with their sleep homeostatic responses following 3 or 6 hours of sleep deprivation (SD). However, EEG results didn't show significant differences between WT and PKU in different sleep stages. Notably, PKU mice exhibit previously undetected 'spike wave' EEG signals, detectable throughout the wake and sleep stages. The behavioral and cognitive PKU-specific deficits could be related to the deviating EEG signals. We are currently examining the EEG patterns in detail to fully understand the sleep patterns and the response to SD in PKU mice, compared to wild-type littermates. Thank you, Junfei, for this inspiring lecture!

The winner of the second day's best presentation was Adithya Sarma (GELIFES). His outstanding talk, titled "Sleepless Nights, Vanishing Faces: The effect of sleep deprivation on long-term social recognition memory in mice," explored the effect of sleep deprivation (SD) on long-term social recognition memory in mice. Specifically, the research examined whether SD leads to permanent memory loss or merely suboptimal storage and






investigated the mechanisms and potential reversibility of such impairments. Identifying these psychiatric effects could improve treatment strategies and patient outcomes. Their findings provide valuable insights into the adverse effects of SD on social functioning and suggest new directions for developing interventions to enhance sleep quality and cognitive performance.

Henning Schulte (Ophthalmology) shared data about his study on detecting and delineating visual field (VF) defects based on free-viewing eye movements. They developed a novel way of detecting and delineating VF defects from gaze-tracked movie viewing. His data elicited a lot of exciting questions from the audience. Their approach predicted an intact visual field for controls and defects for glaucoma patients. They conclude that free-viewing gaze behavior can reliably be used towards detecting the presence of a VF defect.

At the end of the second day, Lisanne Robbemond (Psychosis (UCP)) presented about the barriers and facilitators in using Virtual Reality relaxation for people with psychiatric problems. Interestingly, they used thematic analysis and found eight themes. Ease of use, immersive factors, and perceived usefulness were identified as both barriers and facilitators. Facilitators in the use of VRelax were a conducive social setting and the experience that it enhanced autonomy. Three barriers were identified: physical discomfort, missing transition back to reality, and shortcomings in guidance. The themes emphasize the need for balance between tailoring VRelax to individual needs and current affective states. Along with this need, maintaining a sense of autonomy and receiving sufficient guidance from the healthcare professional are pivotal in the implementation of VRelax as a therapeutic tool in clinical practice.

Lastly, Kimberly Wickborn (Radiology, Nuclear Medicine, and Molecular Imaging) concluded the day with an outstanding presentation on radiotherapy (RT)-induced changes in the brains of proton-treated patients with low-grade glioma (LGG). Her preliminary findings were both compelling and thought-provoking, revealing a significant decrease in volume in the contralateral grey matter and hippocampus just 2.5 years post-RT. These insights pave the way for future research aimed at mitigating these effects and improving the quality of life for LGG patients undergoing proton therapy.

● ARTICLE AND PHOTOS BY ZHENYU ZHANG





REMA AND OTHER NEWS

On the 3rd of May, the **Alumni Event** took place. Interesting talks were given by BCN Master's Alumni about their careers after completing the BCN Master. More about the event can be found on page 14.

On the 1st and 2nd of July the **2024 BCN Summer Symposium** took place. Both 1st and 2nd ReMa BCN students shared the progress and results of their projects and lines of research. It was possible to invite guests to attend. This year's Summer Symposium was different than the previous ones, as all 2nd-year students gave a short, TED talk-like, presentation about their research, some of which were held online. The talks were organized in parallel sessions, and each presenter had 15 minutes to present. It was possible to present online for the first time, as some students were still abroad doing their major research projects. The award for the best presentation was given to **Sara Masetti**, who was working on the quantification of BDNF after a low-dose oral esketamine administration in treatment-resistant major depression in humans. 1st-year students presented their minor research projects during poster sessions, and **Dimitris Tantis-Tapeinos** received the best poster award. Congratulations to Sara and Dimitris!

A key-note speaker, Timo Istace, a PhD researcher at the University of Antwerp, gave a talk about the neurorights debate – a human rights approach toward neurotechnology, during which he raised the issue of establishing laws in the development of neurotechnology.

Furthermore, a room for discussion about the roads of neuroscience in the form of a round table was organized. It was led by Niki Gervais and Robbert Havekes and attended by almost all BCN ReMa students. It included lots of interesting and valuable thoughts, about, among others, the importance of interdisciplinarity, the pros and cons of open-access papers, and the skill of explaining science to people outside of the field.

Last, but not least, the **BCN Spotlight Award** was given to **Mark Nieuwenstein** for his incredible contribution to BCN Research Master over many years. Thank you and congratulations!

The Summer Symposium ended with drinks organized by the BCN Student Council.

Lastly, yet importantly, **Giulia Quagliozzi**, a first-year BCN C-track student has been awarded the **GUF-100 prize 2024**. Congratulations! The GUF-100 prizes are awarded yearly to the best students at the University of Groningen. They consist of a certificate and €2,500 in prize money. Giulia was nominated by one of her lecturers, who wrote a very positive letter of recommendation about her work. She finances her studies herself and has been achieving very successful academic results, such as graduating summa cum laude (average mark of 9.2/10) from her Bachelor's program in Psychology and currently averaging 9/10 in the BCN Master. Read more about Giulia's achievements here!

BY MAŁGORZATA (MARGOT) TYBUSZEWSKA

GRAND STUFF

Mark Hipp, Bart Eggen, among with colleagues, receive prestigious research grant

Dr. Mark Hipp is involved in the research grant that received the NOW Gravitation grant.
Prof.dr. Bart Eggen is involved in the next research that may start with the NOW Graviation grant.
https://www.rug.nl/about-ug/latest-news/news/archief2024/nieuwsberichten/0328-zwaartekracht-beurs

Kirsten van den Bosch is the winner of the 2024 Best Practice in Teaching and Learning Award

https://www.rug.nl/about-ug/latest-news/news/archief2024/nieuwsberichten/0408-best-practice-kirstenvdbosch

Hersenstichting grant for Tom de Koning

Tom de Koning from Genetics and Neurology has received a grant of €370.000 from the Brain Foundation to develop a gene therapy for North Sea disease.
https://intranet.umcg.nl/-/subsidie-hersenstichting-voor-tom-de-koning?p_l_back_url=%2Fkudos

EarlyMoves is a finalist for the National 'Zorginnovatie' prize

The innovative system EarlyMoves, which leads to early detection and treatment of babies with developmental disorders, is a proud finalist for the National Healthcare Innovation Award. The collaboration between Arie Bos, professor of neonatology, and the company Neolook Solutions is beneficial for doctors, parents, and babies.
https://intranet.umcg.nl/-/earlymoves-is-finalist-voor-de-nationale-zorginnovatieprijs?p_l_back_url=%2Fkudos

ZonMW grant for research on cognitive changes after sepsis

NWO has awarded a €2.7 million grant to a partnership between the UMCG, Royal Visio and several other parties. A collaboration between the Department of Internal Medicine (Monika Trzpis, Barbara van Munster, Hjalmar Bouma, Rijk Gans), the Department of Pathology and Medical Biology (Jon Laman), the Department of Gynecology (Marco de Bruyn), Amsterdam Medical Center (Eleonora Aronica), and the University of Dublin (Colm Cunningham) has been awarded a grant of €749.671 from ZonMw under the Open Competition call.

Jon van Rood Medal awarded to Jon Laman

Prof. Dr. Jon Laman has been awarded the Jon van Rood Medal for his extraordinary contribution to the field of immunology and to the Dutch Society for Immunology. He has made major contributions in promoting the transfer of immunology knowledge to the general public through outreach and education. His work has advanced the quality of immunology research, and increased the societal impact of all those active in the field of immunology. He has supported the Dutch Society for Immunology throughout his career by serving on multiple DSI/NVvI committees (the Board, van Bekkum Thesis award, 50th anniversary). Moreover, he has been an outstanding mentor and role model for many young immunologists.

UPDATE FROM THE BCN PHD COUNCIL

Science Jam x Improv Edition

After our last two successful science jams, we wanted to end the year of 2023 big - with a special Science Jam edition: ***BCN x Improv Comedy Groningen***.
On December 13th, 2023, we invited seasoned Improv Comedy teachers and players to ensure an interactive experience like never before.
In a world often defined by structure and rules, improv comedy offers a refreshing escape into the realm of the unknown. Improv comedy, often hailed as the art of spontaneous humor, is a theatrical form where performers create scenes, characters, and dialogue on the spot, without the constraint of a script. Rooted in creativity, quick thinking and collaboration, improv comedy captivates audiences with its unpredictability and wit. At the heart of improv lies the principle of "yes, and..." This fundamental rule encourages performers to accept each other's ideas and build upon them, fostering a seamless flow of creativity. With no predetermined plotlines or rehearsed punchlines, every moment becomes a blank canvas, waiting to be painted with laughter. During this evening, BCN members were not merely spectators; they were integral to the action, providing suggestions, and even stepping onto the stage for games like "Three-headed-expert" and "Mannequin".
Thanks again to our speakers for getting us out of our comfort zone and reminding us that sometimes, the best moments in life are the ones we never saw coming.

Dot drinks

During March we decided to bring a little bit more fun to our regular drinks at the Dot by having a crazy socks competition. From humorous patterns to outrageous designs, the creativity on display was off the charts. A big thanks to everyone for participating and congratulations to our two winners!

Science Jam x Urban Sketching

Then in mid-April, we had our most recent BCN Science Jam. It was an absolute blast with the introduction of urban sketching. Delving into the vibrant world of urban sketching allowed us to put pencil to paper and bring what we see on a beautiful photograph to life. The event offered participants a choice of three difficulty levels, catering to both beginners and seasoned sketchers alike, ensuring everyone could fully immerse themselves in the experience. One highlight was learning about the Urban Sketchers community and their global impact, providing insight and inspiration about this not so known topic. The ambiance was further elevated by the background music, creating an atmosphere of creativity and relaxation. Moreover, the event provided ample opportunity for socializing and networking, fostering connections among both new and familiar faces within the BCN community. The addition of snacks and beer added to the convivial atmosphere, making for a truly enjoyable and laid-back evening of drawing and camaraderie.
To top it all off, participants were able to take home their sketchbooks as a memento of the event, serving as a reminder of the wonderful time spent together exploring the art of urban sketching.

We are looking forward to the next science jam.

- **BY KIMBERLY WICKBORN, RONJA EIKE AND NAD'KA MAJERNÍKOVÁ**
  PICTURES BY VARIOUS PEOPLE

PHD AND OTHER NEWS

The links to the nice blog in the last issue

You probably missed the links to the blog "getting your PhD is something you can learn" (with a little help from a blog), as well as the link to the article in the UKrant, an article about this blog that might help you with questions you have concerning your PhD. They are now included in this issue.

BCN Training Programme, there are two editions

Since the BCN Training Programme has changed, I receive questions about the BCN EC's one should get. Please check the training programme I sent you at the start of your project and/or the new edition I sent you lately. Please contact me if you are doubting if you earned the EC's you need to receive the BCN Certificate.

Update new course registration system

The GSMS is finalizing the testing of the new course registration system. The system will be online after the summer break. The old system will be offline during the summer break. We will inform you by email about the changes soon.

BCN Lectures

We like to offer you lectures with topics out of the box. You will receive BCN EC's for the lectures that are announced as BCN (Lunch) Lectures, that take normally place on the first Thursdays of the month, during lunch time (12 a.m. till 1 p.m.) online, or in a room from 16 till 17 p.m. the first lecture after the summer break will be organized by the Faculty of Philosophy on September 5, 2024.

We also pick up the thread of BCN Alumni lectures. Although you will not receive EC's for these kind of lectures, we are sure that they will be interesting and informative for your project. I will keep you informed.

FAQ

Is it possible to use the budgets of BCN for lab visits?
No, there is a budget for external courses and a budget for conferences, both 600 euro per calendar year. You can only use these budgets for courses (courses, summer schools, workshops) and conferences (conferences, scientific meetings), so lab visits or other visits cannot be claimed in these budgets.

Agenda BCN Activities

September 5:
BCN Lunch Lecture

September 13:
start BCN Orientation course

October 3:
BCN Lunch Lecture

November 7:
BCN Lunch Lecture

December 5:
BCN Lunch lecture by Vania D'Aguiar

Good to know

If you would like discuss work related or personal issues, please to contact the confidential counselor of our Graduate School:

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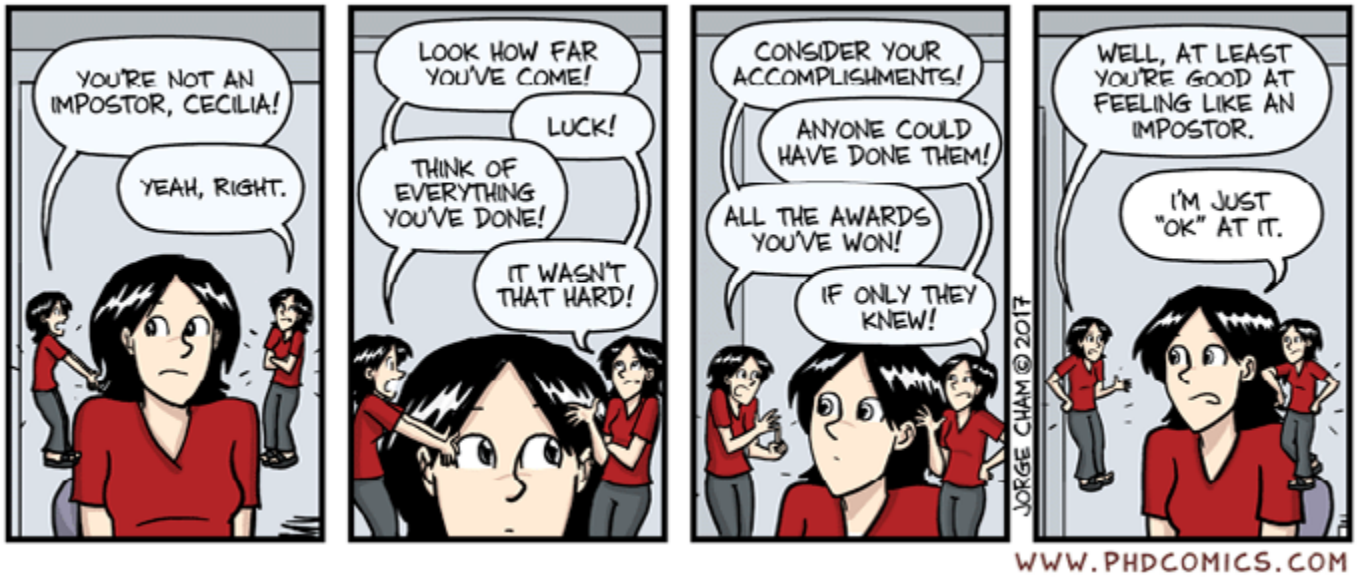
coordinator GSPh.

BY DIANA KOOPMANS



Treatment for Social Cognitive Impairments in Various Neurological Disorderss

After brain damage, multiple cognitive domains such as memory, attention, language or executive functioning could be impaired. It is, however, less known that social cognitive functioning can be impaired as well. Social cognition can be described as information processing in the social world and is often divided into three aspects (Adolphs, 2001):

1. Perceiving social information (facial emotion recognition);
2. Understanding social information (perspective taking, Theory of Mind (ToM));
3. Regulating and adapting social behaviour (e.g., moral reasoning).

Social cognitive impairments can have a negative impact on patients' social participation, quality of life, and their social relationships which makes it very important that suitable treatment is available."

In the brain, social cognitive functioning is related to the frontal-subcortical networks (Adolphs et al., 2009). Therefore, impairments in aspects of social cognition are disorder-transcending: they have been demonstrated in various neurological disorders that can damage these networks, such as traumatic brain injury, stroke (including subarachnoid haemorrhage), brain tumours (both low-grade glioma's and meningioma's), Parkinson's disease and multiple sclerosis (MS) (Buunk et al., 2016; Cotter et al., 2016; Goebel et al., 2018; Henry et al., 2016; Spikman et al., 2012).

In practice, impairments in social cognition can lead to changes in one's behaviour. These changes can vary per patient and can be present from the very subtle to the very obvious. Often patients' personality traits change or are reinforced after brain injury. This can, for example, lead to patients being more focussed on their own world and less aware of the feelings of someone else, difficulties in showing empathy, problems in one's emotion regulation, or disinhibited behaviour such as inappropriate comments or talking too much. Besides, patients often lose insight into their own functioning which makes it hard for patients to recognize that their behaviour is inappropriate in the current situation, while those close to them can see how their proxy has been changed. All this can have a negative impact on social participation, patients' quality of life, and their social relationships which leads to social isolation, lost friendships and divorces. Moreover, these impairments in social cognition are a burden for patients' close ones and makes the availability of effective treatment extremely important for both patients and their support networks (Benedictus et al., 2010; Morton & Wehman, 1995; Westerhof-Evers et al., 2019; Yeates et al., 2016).

Recently, the first multi-faceted treatment for social cognitive impairments has been developed and evaluated for patients with traumatic brain injury; T-ScEmo (Treatment Social cognition and Emotion regulation; Westerhof-Evers et al., 2019). During this treatment, patients focus in 20 treatment sessions and three different modules on the three named aspects of social cognition. During the first module, patients learn various strategies to improve facial emotion recognition such as recognizing cues in the face or mimicry. In the second module, patients learn how to pay attention to someone else's perspective. During the third module, patients learn various (basic) skills to regulate their behaviour (Westerhof-Evers et al., 2019).

Westerhof-Evers et al. (2017) showed that patients improved on facial emotion recognition, ToM, social participation, quality of life, and social relationships (as rated by someone close to them) after T-ScEmo. These results remained present for at least 5 months after treatment, suggesting a lasting effect after the immediate phase.

Up to now, no effective and evidence-based treatment has been developed for social cognitive impairments in neurological patients, other than traumatic brain injury. Therefore, the objective of the new, current study and my PhD project is to evaluate the effectiveness of the multi-faceted T-ScEmo treatment in various neurological patient groups that are eligible for rehabilitation treatment, such as patients with a stroke (including subarachnoid haemorrhage), brain tumours, MS, and other disorders. Moreover, various factors which may influence the effectiveness of the treatment will be investigated and monitored. At this moment the study is open for participant inclusion. Over 60 patients already have been included with a varying spectrum of brain injuries, including patients with brain tumours, MS, stroke and other neurological diseases such as Parkinson's disease.

T-ScEmo would be the first multi-faceted, transdiagnostic treatment for social cognitive disorders that could be used in clinical practice.

Hopefully, T-ScEmo will be as effective for patients with various neurological disorders as the results showed it to be for patients with traumatic brain injury. If so, T-ScEmo would be the first multi-faceted, transdiagnostic treatment for social cognitive disorders that could be used in clinical practice. This is important for patients and their significant others to have a positive impact on patients' quality of life, participation, and relationships.

● BY AMBER HEEGERS

References

Adolphs, R. (2001). The neurobiology of social cognition. Current opinion in neurobiology, 11(2), 231-239.

Adolphs, R. (2009). The social brain: neural basis of social knowledge. Annual review of psychology, 60, 693-716.

Benedictus, M. R., Spikman, J. M., & van der Naalt, J. (2010). Cognitive and behavioral impairment in traumatic brain injury related to outcome and return to work. Archives of physical medicine and rehabilitation, 91(9), 1436-1441.

Buunk, A. M., Groen, R. J., Veenstra, W. S., Metzemaekers, J. D., van der Hoeven, J. H., van Dijk, J. M. C., & Spikman, J. M. (2016). Cognitive deficits after aneurysmal and angiographically negative subarachnoid hemorrhage: Memory, attention, executive functioning, and emotion recognition. Neuropsychology, 30(8), 961.

Cotter J, Firth J, Enzinger C, Kontopantelis E, Yung AR, Elliott R & Drake RJ (2016). Social cognition in multiple sclerosis: a systematic review and meta-analysis. Neurology, 87

Goebel, S., Mehdorn, H.M., & Wiesner, C.D. (2018). Social cognition in patients with intracranial tumors: do we forget something in the routine neuropsychological examination? Journal of Neuro-Oncology, 140(3), 687-696.

Henry, J.D., von Hippel, W., Molenberghs, P., Lee, T., & Sachdev, P.S. (2016). Clinical assessment of social cognitive function in neurological disorders. Nature Reviews Neurology, 12(1), 28-39.

Morton, M. V., & Wehman, P. (1995). Psychosocial and emotional sequelae of individuals with traumatic brain injury: a literature review and recommendations. Brain injury, 9(1), 81-92.

Spikman, J. M., Timmerman, M. E., Milders, M. V., Veenstra, W. S., & van der Naalt, J. (2012). Social cognition impairments in relation to general cognitive deficits, injury severity, and prefrontal lesions in traumatic brain injury patients. Journal of neurotrauma, 29(1), 101-111.

Westerhof-Evers, H. J., Visser-Keizer, A. C., Fasotti, L., & Spikman, J. M. (2019). Social cognition and emotion regulation: a multifaceted treatment (T-ScEmo) for patients with traumatic brain injury. Clinical rehabilitation, 33(5), 820-833.

Westerhof-Evers, H. J., Visser-Keizer, A. C., Fasotti, L., Schönherr, M. C., Vink, M., van der Naalt, J., & Spikman, J. M. (2017). Effectiveness of a treatment for impairments in social cognition and emotion regulation (T-ScEmo) after traumatic brain injury: a randomized controlled trial. The Journal of head trauma rehabilitation, 32(5), 296-307.

Yeates, G., Rowberry, M., Dunne, S., Goshawk, M., Mahadevan, M., Tyerman, R., ... & Tyerman, A. (2016). Social cognition and executive functioning predictors of supervisors' appraisal of interpersonal behaviour in the workplace following acquired brain injury. NeuroRehabilitation, 38(3), 299-310.

BCN THESIS DEFENCES

Exploring inner depths: A qualitative investigation of patients' lived experiences with psychedelic treatments of depression

PHD STUDENT
J.J. Breeksema
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Exploring inner depths: A qualitative investigation of patients' lived experiences with psychedelic treatments of depression
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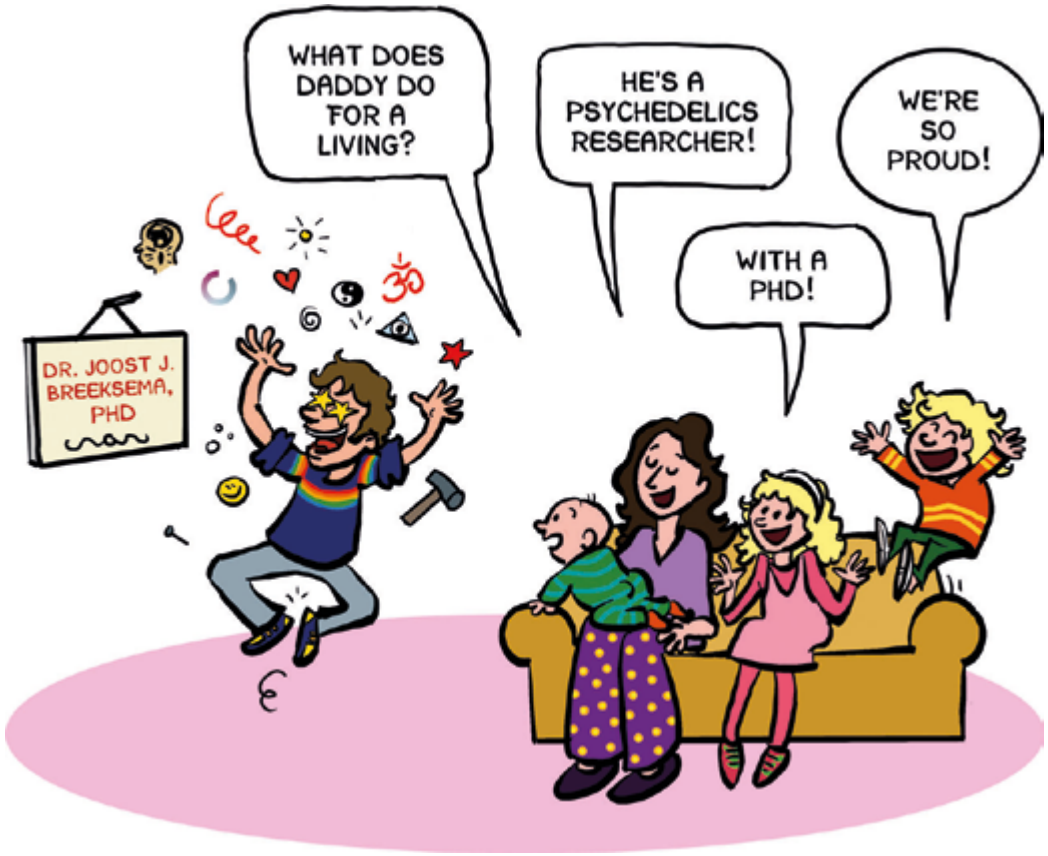
Psychedelics are remarkable substances that produce a wide range of effects and can cause both harm and healing. Clinical research into psychedelic treatments is booming. This thesis first reviews the quantitative effects of psychedelic treatment in patients with mental disorders. However, relatively little is known about how patients experience these treatments. In the second part of this dissertation, we report about patients' experiences with psychedelic treatments (either ketamine or psilocybin). The aim was to better understand how these treatments might work therapeutically, and, at least as importantly, how to improve how these treatments are offered in the future.

Many patients with treatment-resistant depression reported intense and overwhelming experiences that sometimes made them feel (quite) anxious, although this was often temporary. While anxiety is frequently reported as an adverse reaction, in psychedelic treatments this can also be therapeutically meaningful. Patients who felt ill prepared or insufficiently supported often struggled to let go of control and surrender to the experience, which increased their discomfort. On the other hand, trust in therapists, realistic expectations, and feeling emotionally supported actually made it easier to surrender to the experience and reduce anxiety. On ketamine, patients had experiences hinting at a psychotherapeutic potential, such as increased openness, more detachment from negative thoughts and ruminations, and even mystical-type experiences. Patients who received psilocybin wished for multiple sessions, longer-term therapeutic support. Across studies, patients' experiences yielded

PHOTO BY MARTIJN SPIJKER



concrete, relatively easy-to-implement recommendations – including thorough training of clinical staff – which may have a positive impact on the experience and comfort of participants, and possibly help improve treatment outcomes.

Joost Breeksema defended his thesis on March 14, 2024

In the afterglow: immune dysfunction in schizophrenia spectrum disorders

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In the afterglow: immune dysfunction in schizophrenia spectrum disorders
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Recovering from schizophrenia spectrum disorders (SSD) is challenging, because current treatments are sub-optimal. Motivated to find a cure, researchers study the immune system as a biological underpinning of schizophrenia. This thesis explores immune dysfunction as a potential cause of SSD, by studying the effects of an anti-inflammatory agent (simvastatin) on SSD symptoms and by investigating signs of neuroinflammation with magnetic resonance imaging (MRI). The placebo-controlled clinical trial showed that simvastatin was not effective in improving symptoms and

PHOTO BY SANDER MARTENS

cognition in individuals with early-phase SSD at the 12-month endpoint. In addition, MRI measures did not suggest immune dysfunction in the brain in early-phase SSD. Increased extracellular free water (EFW) in cerebral white matter (WM) is regarded as an indicator of neuroinflammation. Although we found evidence that the WM microstructure is altered in SSD, other indicators of increased EFW were absent. Immune-cells in the brain remove brain cell-structures (i.e. pruning) during early (neuro-) development, which could result in smaller brain volumes in SSD. We found that complement component 4A (C4A; a protein involved in pruning) was not related to general measures of brain volumes or cognitive function, but higher levels of C4A were specifically related to smaller frontal brain volumes in SSD.

This thesis does not support the hypothesis of immune dysfunction in SSD. Recent anti-inflammatory trials also fail to show improvement in SSD, thus the potential of the immune hypothesis remains uncertain. Future studies will focus on who could benefit most by anti-inflammatory treatments, by defining SSD-subgroups with immune dysfunction.

Shiral Gangadin defended his thesis on March 20, 2024.

Guidance and performance of somatic management practices in patients with mental disorders

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Guidance and performance of somatic management practices in patients with mental disorders
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The life expectancy of patients with a mental disorder, both common and severe, is between 10-30 years shorter compared to the general population. Approximately 60% of this increased mortality risk is explained by increased risk of somatic comorbidities, which can originate from psychotropic drug-related adverse effects. Therefore, (inter) national clinical practice guidelines (CPGs) provide recommendations on which somatic parameters should be monitored among patients with mental disorders. However, adherence to CPGs' monitoring recommendations is suboptimal in clinical practice. Next to monitoring of somatic parameters, another approach, based on pharmacogenetics, could focus on minimizing adverse effects. Here, a possible relationship is explored between the rate at which a psychotropic drug is broken down by the liver (drug metabolism rate) and the occurrence of adverse effects.

The aim of this dissertation was to explore somatic monitoring, its outcomes, and the management of psychotropic drug-related adverse effects, as well as to explore a potential relationship between the rate of drug metabolism and the occurrence of adverse effects.

We can conclude that CPGs often lack clarity about the exact roles and responsibilities in treating aberrant parameters values and barely present monitoring recommendations for older patient populations (>65 years). These findings could explain the found suboptimal somatic monitoring and treatment rates in patients with a mental disorder. Furthermore, both collaboration and communication between different healthcare professionals could be improved.

PHOTO BY CHASE WANG

Finally, there seem to be no relationship between the drug metabolism rate of psychotropic drugs and the occurrence of adverse effects in patients with a mental disorder.

Jurriaan Brouwer defended his thesis on April 3, 2024.

Radiotherapy-induced brain injury: a role for PET and SPECT imaging?

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Radiotherapy-induced brain injury: a role for PET and SPECT imaging?
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Irradiation of brain tumors not only kills tumor cells, but can also induce damage to normal cells, which can eventually lead to detrimental effects. The neuroimaging techniques PET and SPECT could be applied to investigate radiotherapy-induced brain-injury in a longitudinal manner. These techniques might be able to detect molecular and functional changes before symptoms or anatomical abnormalities present themselves. We aimed in this study to obtain more insight in the status of the normal brain after radiotherapy using PET and SPECT with various tracers. For this purpose, we irradiated the whole brain of healthy rats and monitored the animals for up to 90 days using behavioral tests and neuroimaging. In particular, we studied the radiation-induced effects on neuroinflammation, myeline-density, brain metabolism and cerebral blood flow, using PET and SPECT.

Our studies showed that whole brain-irradiation led to an increase in brain metabolism, cerebral blood flow, and microglia activation in the acute phase after irradiation (day 3-12), indicating an acute inflammatory response was induced. In the early-delayed phase (month 1-2), some neuroinflammation was still present and a trend towards a decrease in myelin density was observed, which recovered in the late-delayed phase. At the start of late-delayed phases (month 2-3), a reduction in brain metabolism appeared, which could indicate late degeneration was occurring. At this stage, outcome measures of memory tests correlated with myelin-density in the irradiated group. Thus, we showed that PET and SPECT are useful techniques for in-vivo monitoring of the sequential effects of radiotherapy on non-tumorigenic brain tissue.

PHOTO BY BRUNO GIACOBBO

Andrea Parente defended his thesis on April 17, 2024.

Genetic myoclonus

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Genetic myoclonus
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Myoclonus are brief, involuntary jerks that can occur continuously in the whole body. The jerks are caused by overactive nerves and have many different causes. There are many different genetic conditions that are associated with myoclonus; each form is very rare and often incurable.

This thesis of Sterre van der Veen provides an overview of all genetic forms of myoclonus, with the overarching goal of improving recognition and diagnosis by physicians.

Genetic myoclonus is often a complex clinical phenotype with multiple accompanying symptoms (e.g., epilepsy, coordination disorder), ultimately resulting in a disabling movement disorder. By combining several disciplines, this thesis provides a broad perspective on this rare patient group. We have collected a large group of patients with genetic myoclonus and described their natural course over time. First steps have been taken to find an explanation as to why some patients are more severely affected and develop accompanying epilepsy while others do not. We found that it is very useful to analyze myoclonus with electrodes that measure muscle activity (i.e., electromyography) to identify the anatomical location of the overactive nerves. Furthermore, 'negative' jerks can be identified, causing sudden loss of muscle activity associated with frequent falls and wheelchair-dependency.

In summary, this thesis provides insight on the various causes and disease course of genetic myoclonus enabling physicians to improve care for this rare patient group.

Sterre van der Veen defended her thesis on April 24, 2024.

Optimal targeting of deep brain stimulation in Parkinson's disease

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THESIS
Optimal targeting of deep brain stimulation in Parkinson's disease
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Medical Sciences

This PhD-thesis of Naomi Kremer is a significant next step in optimizing Deep Brain Stimulation (DBS) for Parkinson's disease (PD), a sophisticated treatment in which electrodes are implanted into deep regions of the brain to mitigate symptoms.

Key findings include the revelation that electrodes placed within 2mm of the intended target do not necessitate repositioning for effective motor improvement. This challenges the existing notion of a rigid surgical accuracy threshold, highlighting the need for transparent reporting on electrode placement.

Furthermore, postoperative MRI and intraoperative CT are compared for electrode verification, with intraoperative CT emerging as a viable MRI alternative. Also, extended Hounsfield unit CT is introduced as an advanced imaging technique for superior visualization of electrode contacts, aiding in accurate verification of electrode positioning, to determine the need for surgical revision, and to inform Deep Brain Stimulation programming. Finally, this thesis explores the microlesion effect as a potential indicator of successful electrode positioning. It employs advanced imaging, such as 7-Tesla MRI coupled with diffusion-weighted imaging sequences, for visualizing relevant brain connectivity, aiming for personalized Deep Brain Stimulation strategies. Combined, the findings suggest that accurate electrode placement, informed by innovative imaging and connectivity insights, could significantly enhance Deep Brain Stimulation treatment outcomes. This thesis underscores the potential of tailored Deep Brain Stimulation approaches, promising a future of improved care for Parkinson's disease patients.

Naomi Kremer defended her thesis on May 8, 2024.

How appropriate is the increased use of methylphenidate?: A practice audit and placebo-controlled discontinuation trial

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How appropriate is the increased use of methylphenidate?: A practice audit and placebo-controlled discontinuation trial
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At the beginning of this century, there has been a steep increase in the number of prescriptions of methylphenidate to children and adolescents to reduce concentration problems and hyperactive behaviour. In parallel, public debate arose about the possible overdiagnosis of attention-deficit/hyperactivity disorder (ADHD) and overtreating children with methylphenidate. In several studies I investigated the extent to which methylphenidate is used appropriately. I conclude that, on average, methylphenidate is still an effective treatment after two years of use. However, a significant proportion of children and adolescents, can stop taking the medication without deterioration. This shows that there is a group of children and adolescents who continue to take medication unnecessarily use and are therefore unnecessarily exposed to possible negative effects in the long-term, such as reduced height. In practice, therefore more attention should be paid to when and how to stop medication.

PHOTO BY SARA VAN DER TUIN

I also conclude that in adherence to guidelines for the diagnosis and treatment of ADHD, there is much room for improvement, both in adherence to recommendations for the diagnosis of ADHD and for the indication of methylphenidate. Better adherence to guidelines contributes to children and adolescents receiving the right care more often and less likely to receive unnecessary or potentially ineffective treatment.

Anne-Flore Matthijssen defended her thesis on May 15, 2024.

Capturing tinnitus: Audiological assessment and tailored sound-based intervention

PHD STUDENT
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Capturing tinnitus: Audiological assessment and tailored sound-based intervention
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To date, no cure has been found for tinnitus. Although tinnitus research has experienced exponential growth over the past two decades, our understanding of its underlying mechanisms remains incomplete. One aspect of the challenge in solving this puzzle is the strong correlation between tinnitus and hearing loss, making it particularly difficult to distinguish one from the other. Furthermore, tinnitus is heterogeneous, in the sense that it manifests differently in each patient, adding an extra layer of complexity to this problem.

With the aim of gaining a deeper insight into these issues, Jose Lopez Santacruz's thesis explored various assessment methods of tinnitus. Additionally, various approaches to hearing aid amplification were evaluated as potential treatments for tinnitus. Overall, this thesis examined various aspects of tinnitus from a clinical perspective, including measuring and assessing the impact of tinnitus and its treatment. These findings indicated that ABR (Auditory Brainstem Response) does not have the potential to become a reliable diagnostic tool for tinnitus, highlighting the heterogeneity of individual responses. Consistent with these results, the analysis of masking contours and hearing thresholds underscored the heterogeneity

PHOTO BY JOÂLLE JAGERSMA

of tinnitus and suggested that there may be no distinct subgroups of tinnitus.

Additionally, this thesis includes a questionnaire for assessing the impact of tinnitus and response to treatment for Dutch-speaking clinics, and a self-guided method for pitch matching that proved to be reliable in a clinical population. Clinical research has shown that the use of notch or boost amplification settings is not significantly better than using a standard amplification scheme in hearing aids for the treatment of tinnitus. This trial also emphasized the importance of tailoring sound-based therapies for tinnitus.

Jose Lopez Santacruz defended his thesis on May 29, 2024.

Neuroscientific insights into executive functions: From brain waves to behavioral improvements through neurofeedback

PHD STUDENT
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THESIS
Neuroscientific insights into executive functions: From brain waves to behavioral improvements through neurofeedback
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Behavioural and Social Sciences

This PhD research focuses on executive functions; cognitive processes crucial for independent, adaptive and goal-directed behavior in everyday life. Executive functions depend on a superordinate brain network, involving different parts of the cortex. The synchronization of neural oscillations (i.e., brain waves) is a fundamental communication mechanism within such brain networks that enable cognitive processes. For executive functions, theta oscillations (4-8 Hz) are of particular interest because they are

generated in response to events that require cognitive control. Specifically, two neurophysiological markers of executive function have been identified that are related to theta oscillations: theta power in the frontal-midline of the cortex and functional theta connectivity in the superordinate network. Despite the crucial importance of efficient underlying neural mechanisms for adequate executive functions in daily life, executive functioning is believed to be the result of a complex dynamic interaction between various biological, psychological, and social factors.

This PhD research investigated (1) the neurophysiological theta markers underlying executive functions in adults who report subjective complaints about their executive functioning, (2) the effects of frontal-midline theta neurofeedback as a neuroscientific intervention for improving executive functions in this group, as well as the overall effectiveness of this neurofeedback protocol in upregulating frontal-midline theta, and (3) psychological predictors of subjective self-reported executive functions.

Diede Smit defended her thesis on May 30, 2024.

PHOTO BY JENNE HOEKSTRA

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

CHEEKY PROPOSITIONS

In the pursuit of knowledge, one must occasionally transcend disciplinary boundaries as well as the constraints of consensus reality. For, as William Blake put it: 'As the true method of knowledge is experiment, the true faculty of knowing must be the faculty which experiences.'

Joost Breeksema

We don't see things as they are; we see them as we are.

Shiral Gangadin

A picture is worth a thousand words (Fred R. Bernard). However, superimposing multiple images acquired with different tracers or with different modalities is even better.

Andrea Parente

Het gegeven dat verbeterde somatische monitoring niet gelijk staat aan verbeterde behandeling van somatische gevolgen aan hen die het nodig hebben, geeft aan dat meten niet gelijk staat aan weten.

Jurriaan Brouwer

Learning never exhausted the mind (Leonardo Da Vinci), does not always apply, especially if you have to read a lot of articles. [chapter 3].

Andrea Parente

There is no better future for a method than to be replaced by an even better one. (Alim-Louis Benabid)

Naomi Kremer

Alternative medicine that's been proved to work is called medicine (Tim Minchin)

Jose Lopez Santacruz

Every PhD student should have a vegetable garden for their mental sanity.

Diede Smit

COOL LINKS

> Article

https://www.sciencenews.org/article/parrot-intelligence-smart-brain-behavior

This article explains that, despite substantial differences in external brain anatomy, parrots and humans have cognitive similarities: just like people, parrots can learn words, make and use tools and control themselves when tempted with a treat. The article discusses which parallels exist between the genes and brain functioning of parrots and humans and where parrots' intelligence could originate from.

> Article

https://www.scientificamerican.com/article/a-rare-visual-disorder-twists-faces-out-of-shape1/

This fascinating article concerns 'prosopometamorphopsia', a relatively unknown visual disorder in which people see the faces around them in a distorted way. Fortunately, colour-tinted glasses might help reduce these alarming symptoms.

> Article & Images

https://www.smithsonianmag.com/science-nature/see-seven-stunning-gold-leaf-portraits-of-the-brain-180982668/

For a more artistic break, read this interview with Greg Dunn, PhD in neuroscience, who makes art inspired by the anatomy of the brain. The article, which discusses his sources of inspiration, his technique for adding random variability to his paintings and what he learned from his time as a PhD student, is complemented by beautiful images of his work.

> Article

https://www.smithsonianmag.com/science-nature/can-psychopathic-tendencies-help-you-find-success-180982643/

Is having psychopathic inclinations always a bad thing? This article challenges that view and discusses the idea that, aside from unkindness and impulsiveness, boldness is also connected to psychopathy. In certain professional contexts, this combination of traits could make you an important asset.

> Video

https://www.ted.com/talks/scott_fraser_why_eyewitnesses_get_it_wrong

In this interesting video, Scott Fraser shows that relying on eyewitness testimonies can lead to wrongful convictions. Using a murder case from 1991, he advocates for a stronger reliance on scientific evidence in the courtroom.

BY PENNY HEISTERKAMP

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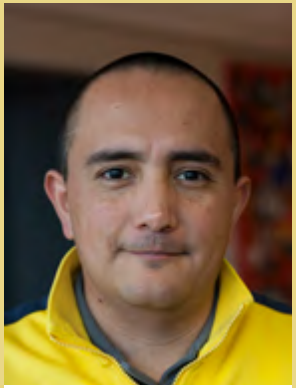
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