Research Internships 2023-2024 Psychology Honours

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Eni Becker

Obsessive-compulsive disorder (OCD) is a relatively uncommon mental health condition, yet its characteristic obsessions and compulsions are widely recognized in everyday life. However, the transition from normal thoughts and actions to pathological symptoms remains poorly understood. This research project aims to investigate the underlying cognitive vulnerabilities associated with OCD. We have designed an interpretation task that focuses on exploring underlying cognitive beliefs, such as thought-action fusion, along with an innovative approach-avoidance task. By examining the relationship between approach-avoidance tendencies and cognitive interpretations, this study seeks to shed light on the vulnerabilities of OCD. In this project, we aim to uncover the intricate connections between approach-avoidance behaviors, cognitive interpretations, and their implications for OCD.
2. **Active Living**

*Hidde Bekhuis*

Our society has reached a peak in physically inactive behavior, which is present across all age groups and all socio-economic status levels. Physically inactive behavior contributes to increasing health issues, subsequently leading to decreased participation in society, work absences, and social isolation. Therefore, it is important to reverse this trend.

In our theme 'active living' we approach this challenge from an interdisciplinary perspective, including psychology, sociology, spatial planning, pedagogics, and communication science. Many partners are involved such as the council of Nijmegen, GGD Zuid-Gelderland, One Planet Research, HAN and others. Several large grants allow us to address questions such as: how do life transitions affect active behaviour, how can we motivate students in pre-vocational education (vmbo) to become more active, how can the built environment stimulate active behaviour, and what are best ways to communicate this message to different groups in society?

Students are invited to deepen their knowledge on this theme and can either join ongoing projects or design their own project.

For more info see: [www.ru.nl/activeliving](http://www.ru.nl/activeliving)
3. Don’t judge a book by its cover

*Gijs Bijlstra, Afreen Khalid, & Max Primbs*

One of the major challenges in today’s society is dealing with discrimination. Besides having a great impact on the lives of individuals, discrimination stands in the way of social progress. A strong commitment to reducing discrimination, preferably through evidence based interventions, is necessary. The Living Library is a non-profit community event that aims to raise awareness and reduce prejudice towards stigmatised groups in society. During these events, which are often held in libraries in the Netherlands, so-called 'Readers' engage in brief, face-to-face, direct interaction with so-called 'Books,' who are real people from various stigmatised social groups. The effectiveness of this intervention technique on attitude change has been demonstrated in preliminary research. However, whether it results in long-term attitude change and behavioural change is unknown. In the current project, you will focus on this intervention technique and examine its effectiveness for attitude and behaviour change, as well as investigate the underlying mechanisms involved.

Reference for inspiration:
4. **Peer Relations in Emerging Adulthood**

*Toon Cillessen*

Emerging adulthood is a critical period of development during which young people make important decisions about education, careers, and relationships that will affect the trajectories of their lives. It is also a time that affords more independence from parents than ever before, allowing young adults more freedom to choose who they do (or do not) spend their time with. In many instances, young adults spend a good portion of their time with peers. However, research on how peer relations (or the lack thereof) affect young adult development is still relatively new.

This honours project will be embedded in a larger research project on peer relations and social development during emerging adulthood. The goal is to examine how concepts like popularity, peer acceptance, peer rejection, and social withdrawal function during the emerging adult years. There is freedom in the honours project to focus on other aspects of the project as the study also captures indices of mental health and relationship quality during emerging adulthood. Thus, you will be encouraged to pursue your own interests and formulate your own research questions within the broad topic of peer relations during emerging adulthood.

We will collect data through online surveys and by inviting groups of 4 young adults to attend a zoom meeting lasting an hour and a half. During this meeting, young adults will participate in a number of interactive tasks including an open discussion about controversial topics, and a survival game in which participants have to work together to decide which items would be most important to keep if you were stranded on a desert island. Zoom meetings will be recorded and coded for behaviors like dominance, submission, prosocial behavior, and more. Participants will also complete a short survey at the end of the zoom meeting where they will record their impressions of the other young adults in the meeting.

You will be supervised by prof. Toon Cillessen together with the other members of the research team (PhD candidates Mallory Millett and Nina Chmielowice-Szymanski).

*The student team should have at least one member able to communicate in Dutch.*

References for inspiration:


5. The smell of fear unravelled

Jasper de Groot

Humans have a much better sense of smell than traditionally thought (McGann, 2017, Science): we can distinguish more odors than the number of seconds in a lifetime, and like super-smeller species (dogs, mice), we can follow scent-trails and detect certain molecules as three drops in an Olympic size swimming pool. Through smells, humans can even pick up social information, like identity, gender, sickness, and transient emotions like fear, usually without being aware of it.

In my research, I focus on the human capacity to communicate fear from a sender to a receiver by means of their smell. This is a question that can be answered from different angles. Actually, the question of whether human body odor can shape social communication has been considered among the 125 most compelling multi-disciplinary scientific challenges of this century (Kennedy & Norman, 2005a, 2005b, Science). In my work, I try to integrate approaches from psychology (measures of affect, perception, behavior, cognition, psychophysiology) to neuroscience (fMRI), genotyping, and – most recently - chemical analysis (as smells consist of molecules). Depending on your interest, we can focus more on psychological paradigms and perhaps get your feet wet with other types of methods that go beyond psychology (e.g., chemical analysis methods). The ultimate goal is to unravel whether there exists a species-wide human capacity to produce and perceive the smell of fear. This requires examining novel samples to assess (for the first time) the scale and degree of the chemical communication of fear. What we also often see is that “social smells” can exert their functions beneath our conscious awareness, underlining the stealth influence smells may have on our lives.

I am very much looking forward to your input, and depending on your interest, we can focus more on particular psychological tasks/paradigms, psychophysiology (e.g., skin conductance), the role of certain genes in fear smell production, ways to collect and present smells using a computer-controlled device, and/or chemical analysis.

For more information, please contact: Jasper.deGroot@ru.nl.

References for inspiration:

6. Child's play? – How babies and young children learn about the world

Sabine Hunnius

Babies and their rapid development are a big miracle: Whereas as an infant we seem to be completely helpless, within just a couple of years, we transform into totally different creatures who have all the abilities and skills to start formal education at school. How is this at all possible? How do babies learn so quickly about the world and the people around them? And what are optimal circumstances for young children to develop in? In the BabyBRAIN group, we study exactly these questions. Using behavioral experiments and advanced experimental methods, we investigate social-cognitive development in babies and young children.

In this project, students will have the opportunity to get acquainted with the exciting, novel research field of Developmental Cognitive Neuroscience. They will contribute to setting up and carrying out a research project with babies or young children and will learn about the different research techniques we use, such as eye-tracking, motion registration, or EEG. To directly work with young children and their parents, it is important that the students, or at least one student member of the group, can communicate in Dutch.

For more information, please visit www.babyandchild.nl or send an email to sabine.hunnius@donders.ru.nl. You can learn more about the research of our group on www.dccru.nl/babybrain.

References for inspiration:


7. Transcranial ultrasonic stimulation: ensuring experimentally sound research

Benjamin Kop & Lennart Verhagen

Transcranial ultrasonic stimulation (TUS) is a novel form of non-invasive brain stimulation with unprecedented spatial focality and depth range. The advent of TUS opens a wealth of opportunities to study the causal role of both superficial and deep brain structures, as well as exciting possibilities for novel clinical interventions.

However, in the early days of human TUS, it is essential that research employs appropriate experimental design and control conditions to account for peripheral co-stimulation and alternative confounding factors. In other words, we need to minimize confounds and maximize efficacy. In the first part of the project, we will map out peripheral auditory and somatosensory confounds associated with a range of ultrasonic stimulation protocols and quantify the efficacy of various methods to ameliorate these confounds (e.g., ramping TUS pulses and administering auditory masking stimuli). This work will form the foundation for sound TUS research in the future.

In an extension of this project, we will use a combined TUS and transcranial magnetic stimulation (TMS) paradigm, in which we will probe the neuromodulatory effects of TUS on motor cortical excitability as reflected by single- and paired-pulse TMS elicited MEP amplitudes. Further, we will conduct a motor learning task (e.g., a sequential finger tapping task) to isolate ultrasonic neuromodulatory effects on motor learning as quantified through, for example, performance, learning rates, and reaction times. Throughout both projects, you will gain hands on experience with brain stimulation techniques, human participant data acquisition, and possibly structural and basic functional MRI measurements.

You will join a welcoming team of psychologists, cognitive neuroscientists, biologists, and engineers. If you are excited by new developments in neurotechnology, enjoy a collaborative team spirit, and are interested in being trained as an experimental cognitive neuroscientist, this is the project for you!

References for inspiration:

- Kop et al., 2023: https://doi.org/10.1101/2023.02.22.527901
- Airan & Butts-Pauly, 2018: https://doi.org/10.1016/j.neuron.2018.05.031

Recommended prerequisites

It is helpful if you are open to working with programming languages (e.g., MATLAB, R, or Python), or already have some basic experience with coding.
8. **Unravelling discrimination: How does prejudice affect decision making?**

*And what can we do about that?*

*Tjits van Lent & Harm Veling*

Everyday life is filled with decisions people need to make. What am I going to eat tonight? With whom will I collaborate on the next study assignment? Who do I want to invite for dinner or do I want to approach in a bar? Prior studies have shown that the decisions people make for these latter types of questions can be biased (for a review see Kawakami et al., 2017). That is, stereotypes and prejudice may for example affect hiring decisions (Andriessen et al., 2010) or preference for whom to collaborate with (Kawakami et al., 2009). In general, people choose more often for ingroup members than for outgroup members. In the current project, you will focus on the underlying processes involved in such biased decision making.

Understanding these underlying processes is key to arrive at better lasting interventions to reduce prejudice and discrimination. So far, the effectiveness of existing interventions to reduce prejudice is relatively weak (e.g., Lai et al., 2014, 2016; FitzGerald, Martin, Berner, & Hurst, 2019; Paluck, Porat, Clark, & Green, 2020). Importantly, to date, only a few interventions look at the process of biased decision making. Therefore, we believe that this could be a promising route to change discrimination.

The current project will employ recent theoretical insights from value-based decision accounts. This is a new model to understand and predict behaviour. Moreover, it gives insight in how to establish behaviour change (i.e., less discrimination). The basic premise of this perspective is that people assign value to a generated set of options and make their decision based on this process (Berkman et al., 2017; Morris et al., 2021). Until now, no studies took this promising approach in studying biased decision making. Can we apply this account to get more insight in how discrimination takes place?

This honours project will be embedded within an ongoing larger PhD project. We will use a novel theory and paradigm to understand and change behaviour. We will conduct experiments, either online or in the lab. We can adjust the specific research question depending on your interests (for example, your interest in certain social groups). For more information, please contact Tjits van Lent: tjits.vanelnt@ru.nl.

Reference for inspiration:

9. Understanding motivation and curiosity

Lieke van Lieshout & Harold Bekkering

Cognitive neuroscience attempts to understand the cognitive and neural underpinnings of human behavior, with increasing attention for the neurocognitive foundations of learning and education. Our research group Learning & Motivation focuses on how we interact with other human beings and exploit current and explore missing knowledge to foster educational learning. Theories from Psychology (e.g., the Self-Determination Theory) and insights from Neuroscience, e.g., the functioning of the dopaminergic reward system) are integrated to understand, model, and foster learning.

A recent challenge within this field is to understand the cognitive and neural mechanisms of motivation and curiosity to learn. Using a combination of behavioral lab experiments and functional MRI scans, we investigate whether and how components of intrinsic motivation (i.e. autonomy, competence and relatedness) and extrinsic motivation (i.e. monetary reward or obtaining high grades for your exam) benefit learning performance. At the same time, curiosity is closely linked to intrinsic motivation, as it can be described as “intrinsically motivated information seeking”. We are currently exploring how we can foster curiosity and under what circumstances curiosity benefits our learning performance, learning experience and our well-being. We also aim to get a deeper understanding of curiosity-driven learning from a neurocognitive perspective.

Our ultimate goal is to innovate life-long learning on the basis of current scientific knowledge about drives for learning.

For more information, please contact:
Lieke van Lieshout, lieke.vanlieshout@donders.ru.nl
Harold Bekkering, harold.beckering@donders.ru.nl
10. Just beat it (beat it): how gestures influence what we hear

Matteo Maran, Patrick Rohrer, Hans Rutger Bosker

Speech comprehension relies not only on what we hear but also on what we see. An example is given by the classic McGurk effect (McGurk & MacDonald, 1976): when you play the word "bake" together with a video of someone saying "fake", most people will report hearing "fake", not "bake" (see demonstration link below). Interestingly, not only lip movements but also the timing of simple up-and-down hand gestures (so-called 'beat gestures') can change what you hear. The same audio is perceived as "PLAto" (with stress on the first syllable) when it is played with a beat gesture falling on the first syllable, but as "plaTEAU" (with stress on the second syllable) when the beat gesture falls on the second syllable; an effect recently discovered and termed the manual McGurk effect (Bosker & Peeters, 2021; see demonstration link below). These effects might reflect our tendency to bind perceptual information which occurs (more or less) simultaneously into a unique representation. This binding seems to vary on an individual by individual basis, with some people having a narrow temporal binding window (TBW, Foss-Feig et al., 2010), only integrating near-simultaneous audiovisual stimuli, and others having a broader TBW, happily integrating non-simultaneous audiovisual stimuli (see also Leonard & Cummins, 2011, study 1).

As part of this honours internship in the Speech Perception in Audiovisual Communication (SPEAC) lab, students will be involved in a research project that furthers our understanding of the manual McGurk effect. We can still ask many questions, such as:
- Do the classic (McGurk & MacDonald, 1976) and manual (Bosker & Peeters, 2021) McGurk effects rely on similar multisensory processes?
- Can the manual McGurk effect be observed in languages other than Dutch?
- Is individual variability in the TBW predictive of individuals' manual McGurk effect size?

Additional topics and research questions related to audiovisual integration and the manual McGurk effect in particular can be considered. To answer these questions, students may make use of a variety of experimental techniques and skills including multimodal (video & audio) annotation, behavioural experiments, motion-tracking, eye-tracking, and EEG. For additional information, please contact Matteo Maran (matteo.maran@donders.ru.nl) and Patrick Rohrer (patrick.rohrer@donders.ru.nl) and don’t forget to visit the SPEAC lab website for more demos (https://hrbosker.github.io/).

Try the classic and manual McGurk yourself (seeing is believing):
- McGurk effect: https://youtu.be/2k8fHR9jKVM

References for inspiration:
11. Learning to balance by success and failure

Eric Maris, assisted by Master CNS students

Elderly cyclists often have problems with bringing their bicycle up to speed from a stop. As compared to cycling at a constant speed, more force has to be generated when coming up to speed. To be effective, these leg forces must be counteracted by reaction forces in the upper body. If these two forces (the leg forces and the upper body reaction forces) are not sufficiently coordinated, this will result in spill-over forces in the arms. Because the arms control the handlebars, which are essential for keeping balance, these spill-over forces are likely to be an important cause of imbalance.

The overarching hypothesis in this project is that it is possible to improve the between-limb coordination (and thus also the balance) by experiencing movement patterns with both successful and unsuccessful coordination. Learning to coordinate forces usually goes by trial-and-error, and in case of an error, the result is often a fall. Because senior citizens are more fragile than younger adults, they experience more fear and are therefore more likely to avoid situations in which they can learn by trial-and-error. As a result, their coordinative skills will deteriorate.

We will make use of a self-developed bicycle simulator (see https://youtu.be/WFevsm-Bn7U) that requires steering to balance, as on the public road, but while wearing a safety harness. We will ask participants to climb simulated hills with different slopes, thereby requiring them to coordinate forces of different amplitudes. Using a motion capture system (Optotrak) we can record the movements of the balance-relevant components of the rider-bicycle system: the rear frame lean angle, the upper body lean angle, and the steering angle (see the left panel in the figure below). We will use these measurements for testing hypotheses about how the balance control strategy changes as a function of experience with successes and failures.
Our hypotheses about the balance control strategy follow from a model for motor control (see the right panel in the figure above) that can be tested by comparing computer simulations with measured kinematic data. The relevant component in this model is the internal state estimate, which depends on a learned mapping of the efference copy on this internal state estimate. We hypothesize that this mapping can only be learned accurately if the CNS is allowed to experience successful and unsuccessful coordination attempts. This hypothesis can be tested by investigating the balancing efficiency of the steering input as a function of the learning experience (i.e., number of training sessions with the simulator). This balancing efficiency can be calculated from the measured kinematic data.

Reference for inspiration:
12. Technology Selection and Usage in Dutch Secondary Schools

Prof. dr. ir. Wolter Pieters, dr. Iris van Ooijen, dr. Inge Molenaar, dr. Raphael Gellert, Ms. Chandrima Chattopadhyay

The buzz around technology use in education is getting louder, including platforms from Microsoft and Google, tools like ChatGPT, but also informally used technologies for e.g. file storage and communication. Because these technologies can have such a large impact, it is important to understand why certain technologies are selected and how values such as privacy are part of that consideration. This project focuses on the choices, decision-making processes and intentions of users of technology in the context of Dutch secondary school. We want to know what these choices are, how were they made and what types of technology are currently being used in the Dutch secondary schools. We explore the Dutch technological landscape through a set of qualitative and quantitative methods. In addition we delve into the role of public values like privacy, security, transparency in those choices. Are you interested in how technology will/is shaping the school education framework in the Dutch schools? In this project you will contribute to setting up and carrying out a research project with school students, teachers and school administrators and will learn about the different research techniques we use in qualitative research for technology selection and usage. We will collect data by interviews, participant observation and focus group discussions. The results are then used as a basis for the quantitative part of the study which involves administering a survey. It is preferred that the student can communicate in Dutch to be able to work with ease in Dutch schools.

You will be supervised by prof. dr. Wolter Pieters together with PhD candidate Ms. Chandrima Chattopadhyay.

References for inspiration:
13. Fear, depression, or loneliness: What makes you avoid other people?

Mike Rinck

Earlier research has shown that the approach and avoidance of emotional faces is changed in strange ways in different emotional disorders. For instance, socially anxious people avoid even smiling faces, and depressed people seem not to approach any faces. However, anxiety and depression often occur together, and they are also related to other problems, like loneliness. Therefore, the planned research aims to find out exactly which emotional problem predicts which aspect of approach-avoidance behavior.

This project is suitable for students who are interested in both clinical topics and experimental methods.

For more information, contact me at <mike.rinck@ru.nl>.
14. Improving early detection and early intervention for infants and toddlers at elevated risk for autism

Michelle Snijder & Sara Pieters

Within our research, we aim to improve early detection of autism spectrum disorder (ASD), as well as easy access to intervention. Specifically, we study the effect of a new intervention called BEAR (Blended E-health for children at eArly Risk). The global focus of the BEAR intervention is helping parents to understand their child's behavior, promoting sensitivity in parents to their child's needs and, through that, to motivate the child to socially engage (e.g., improving joint engagement, enhancing initiatives in communication). The primary objective of this study is to improve joint engagement in the parent-child interaction. Secondary objectives are improving social-communicative development of the child at high risk of ASD, improving parental skills and well-being and decreasing the gap between first concerns and start of adequate intervention. Since we use video data of parent-child interactions, it is advantageous if the students speak and understand Dutch.

For more information, please contact m.snijder@karakter.com or sara.pieters@ru.nl
15. Talker Familiarity in Speech Perception and Production

Orhun Ulusahin, Hans Rutger Bosker & James McQueen

In natural conversations, we constantly switch roles between listener and speaker. Thus, the problems we need to solve change constantly, yet they are often effortless. So, how does the brain manage to do such a good job when everyone speaks and listens differently? In perception/listening, we know that our brains partly deal with this variability of speech by storing knowledge about how individual talkers speak, which helps us tune in to them. You know that your friend from region X has that region’s accent, and you adjust accordingly when she speaks. When your other friend from region Y enters the room, you have no trouble understanding both of them in the same conversation. So, we can say that you have a different set of ears for everyone you know, but does this change anything about how you talk to them? In other words, do you also have a different mouth for every talker you know?

We do know that we generally sound more and more like the people we are talking to over time, in a process called convergence. However, little is known about the extent to which knowing how someone talks affects convergence and speech production at large. Our aim is to further explore the role of talker familiarity in perception, shed light on its role in production, and discuss what this means for the interaction between perception and production. Are you more likely to sound like someone when you know them, or are you actually less likely to sound like them, and why? What social factors might have an effect on the likelihood, amount, or time course of convergence? Can there be changes in how you speak without long-term changes in how you listen? Questions like these are at the center of our research.

To this end, an honours student could, for instance, manipulate natural speech or synthesize artificial speech to have precise control over its acoustics, and directly analyze audio recordings for convergence in speech produced in lab and/or conversational settings. As an honours student, you are encouraged to think about these questions and examples to come up with your own ideas as well. Knowledge of Dutch may help with experiment material preparation in experiments involving Dutch participants, but is not a requirement.

For more info or questions, feel free to contact Orhun Ulusahin (orhun.ulusahin@mpi.nl).

References for inspiration:
When humans interact they tend to coordinate and synchronize different bodily processes (e.g., movement, heart rate) in a phenomenon referred to as interpersonal synchrony. This phenomenon has recently gained interest in the context of the client-therapist interaction.

During a client-therapist interaction, the emotional bond and the sense of collaboration that emerges between them are referred to as the working alliance. Until recently, the working alliance was mainly studied with self-report measures of client and therapist perceptions. However, these measures fail to capture many of the implicit automatic processes that are involved in social bonding. Interpersonal synchrony allows for the working alliance to be studied as an automatic and embodied process, offering us insight into how it develops moment-to-moment.

Also, so far the relationship between interpersonal synchrony and the working alliance has only been explored in observational settings (i.e., real therapy). Our study uses a novel client-therapist role-play interaction task to investigate this relationship in an experimental setup, comparing a collaborative (solution-focused) with an empathic (emotion-focused) conversation condition. Throughout the interaction task, participants’ movements (with video) and physiological activity (heart rate and skin conductance) will be recorded. We are also collecting self-report measures like emotion regulation, emotion recognition, empathy, self-other integration, attachment style, self-efficacy, and more.

The project offers a great opportunity to combine training in experimental research and psychophysiological measurements with applied clinical theory. There is a large room for flexibility in selecting a research question that matches your own interest, from the various measures we collect from both the client and therapist.

You will be supervised by Dr. Jacobien van Peer and PhD candidate Noha Yassen. For more information you can contact us at noha.yassen@ru.nl and jacobien.vanpeer@ru.nl.

References for inspiration: