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From One Brain To Another



"Have you ever wondered how your brain works? We have, too. We'd like to share what we have learned-- from our brains to yours!"

Welcome back to *From One Brain to Another*, a student-run neuroscience newsletter at York Univeristy, Toronto, Ontario, Canada. This newsletter is dedicated to its curious readers who would like to learn about the intricate, alluring discipline that is neuroscience. In this month's issue, our student-written research article discusses the mind-brain problem. Excitingly, we explore the intersection between neuroscience and philosophy! This newsletter serves as a platform for passionate students of all disciplines to obtain research experience and grow into becoming specialists of their fields. Information about programs, such as that of neuroscience, its faculty, ongoing research and opportunities at York University are sprinkled within these pages for the benefit of our audience and future students. **It should be noted that all articles and content contained within this issue are not to be taken as medical advice; the information is collected research communicated by students strictly for educational purposes.**

Table of Contents

Table of Contents

Student Research Article

- ***A Brief Introduction to the Philosophy of Consciousness and Mind-Body Connection***

Graduate Students at York University

Research at York University

Neuroscience Seminars at York University

- ***CIAN Seminars: Dr. Sabine Muzellec***
- ***CVR Seminars: Dr. Kayrel Edwards***
- ***CVR Seminars: Dr. John Morrison***

Opportunities and Events at York University

A Grateful Thank You

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Student Research Article

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A Brief Introduction to the Philosophy of Consciousness and Mind-Body Connection

Neuroscience and philosophy are often viewed as antithetical disciplines, understood as hard science grounded in anatomical empirical research and application, versus a conceptually explorative field of study that employs critical investigation. However, in the study of mind-body correlation and consciousness, the two are both historically and continually entwined! Throughout the establishment of an empirical basis for brain activity, the connection between mind and body, and its practical applications, philosophers posed a fascinating question: Even with a complete understanding of the neural bases of this connection and human consciousness, how can we properly explain what it's like to experience this?

To explore this, we need to identify the problem we're facing - but first, let's unpack some of the relevant facts and terms! For the sake of our discussion, the neuroscientific understanding of the mind-body connection can include various cortices within the brain involved in processing physical or sensory information from the body. The neural basis of consciousness has a plethora of renowned theories, but can largely be reduced to the firing of neurons across the brain. The type of consciousness we come to understand here can be known as *access consciousness*, a term introduced by philosopher Ned Block. (Block, 2007; Morales and Wu, 2025) When building a neurological, empirical understanding of this function, it can be easy to use the terms 'mind' and 'brain' interchangeably - this is where the philosophical definitions come in.

Our brain is the organ within our skull - our mind, however, can be defined as the subjective experience of having a conscious brain that communicates with our body. The branch of philosophy that evaluates questions related to this is called *phenomenology*, the study of subjective experience. Essentially, consider an experience, then ask, "What is it like?" This phenomenological question gained notoriety when philosopher Thomas Nagel evaluated this question in his work "What Is It Like to Be a Bat?" (Nagel, 1974) Given the impossibility of producing an objective answer to any such question, we've arrived at the type of consciousness we seek to understand: *phenomenal consciousness.* (Block, 2007) Within a phenomenal conscious state, humans engage with *qualia*: the qualities of an experience within our mind, usually sensory, such as the colour of an object obtained visually, or the feeling of pain, obtained tactilely. Qualia can only exist

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within our phenomenal consciousness, leading philosophers and scientists to continually debate whether we can claim, with complete certainty, any descriptive characteristic of something we perceive.

Now, circling back to our problem. Neuroscientists can explain the correlation between states of phenomenal consciousness provided through testimony and brain states understood through empirical investigation, thus producing applications of neuroscientific research, psychological theories, etc. However, philosophical questions remain, such as…

Where does our phenomenal consciousness take place? Within the brain, the organ? Or within the mind? Given that the only evidence we have of phenomenal consciousness is human testimony, it should follow that the experience requires brain activity to occur. However, it's possible that it doesn't; we have no capacity to understand the phenomenal experience of being brain-dead. If the mind needs the brain to create a state of phenomenal consciousness, and the brain is an organ within the body, then does phenomenal consciousness technically occur within the body? These are some relevant questions based on experiential, evidence-based investigation, or empirical questions.

To gain a complete understanding of consciousness, we need to understand both access consciousness (brain function) and phenomenal consciousness (qualia). If the second portion of our understanding can only be substantiated by subjective testimony, how can we truly uphold any descriptors of our reality that we commonly view as truth? This is an example of a relevant question concerning the nature of reality - a metaphysical question.

The most famous question regarding consciousness deals with the philosophical study of knowledge - it is epistemological in nature, and known as "The Hard Problem," coined by philosopher David Chalmers. He distinguished between "easy" problems of consciousness, such as ones that can be understood via neurological, anatomical study, and the Hard Problem: How do these objective, empirical bases of consciousness occurring in the brain and body produce the subjective experience of phenomenal consciousness? The problem is "hard" in nature because it can never truly be answered. Philosophers may posit their theories, and scientists may produce instances of correlation in abundance, but it remains logically and practically impossible to generate an objective answer. (Chalmers, 1996)

However, as philosophers and scientists, we can definitely attempt to answer some of our other questions. Regarding our investigation of where our phenomenal experience of consciousness occurs, we can consult philosopher René Descartes. In his famous enthymeme "*cogito ergo sum", "I think, therefore I am,*" Descartes utilized radical doubt to obtain a self-evident truth, dismissing extreme skepticism and proving the existence of his mind (and his consciousness) based on the sole undeniable fact that he was thinking. (Ariew and Watkins, 2019) He went on to investigate the mind-body connection, an

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investigation that preceded our neurological understanding of these topics! Descartes upheld a belief called *substance dualism*, which claims that the mind and body are separate substances, given that the mind is a thinking, immaterial substance, and the body is an extended, material substance. (Ariew and Watkins, 2019; Leach, 2017) Arguments for dualism have been subject to objections and revisions, leading to its positing in a variety of syllogistic forms by various philosophers, but most revolve around the mind and body being distinct, based on their attributes. This rebuts our claim that consciousness could exist within the body, but it lacks a true explanation of interaction.

Monism is the clearest alternative to dualism; it suggests that only one substance exists, and that all else that exists is derivative of this single substance. A monist would likely answer our questions in a theistic manner, claiming that mind, body, and consciousness are distinguished only by their attributes, and if created by one divine substance, they possess an inherent ability to interact. (Ariew and Watkins, 2019)

If you're at all skeptical about the merits of this discussion, let's take a look at *physicalism.* Physicalism is an umbrella term that deals with reducing phenomenal consciousness to its physical components and defines it solely based on these. (Stoljar, 2024) *Materialism* is a category within physicalism claiming that all mental states, and therefore phenomenal experiences, are completely equal to the brain activity that generates them, with a particular emphasis on physical matter being our only means of understanding our criteria for defining consciousness. (Stack, 1998) This is an a priori argument against a dualist view; however, it's quick to falter, given that even materialists cannot disprove the inherent subjectivity in mental or conscious states that identical brain functions could produce. Lastly, *behaviourism*, made famous by Ludwig Wittgenstein, is another denomination within physicalism, which suggests that phenomenal states are evidenced only by the physical behaviour that signifies them. (Leach, 2017) This is an a posteriori argument against a dualist view; however, the reasoning behind behaviourism can become circular when considering how a mental state can often supervene upon physical behaviour - i.e., you might have a disposition, even a perceived need to pick your nose. Still, within your phenomenal consciousness, you stop yourself from doing so. Ergo, your behaviour doesn't represent your mental state; behaviour as a false report of mental states is a common objection to this view.

Now that we've rejected physicalism (which contains our most empirical theories), what do we do about all these questions we've posed? Do we endlessly ponder and pontificate? If you study philosophy, that's almost inevitable. However, let's explore some applications of our journey into our consciousness, brain, and body.

One of the most common fields of application for the study of phenomenal consciousness is bioethics and its related medical fields. Attempting to understand a conscious state that cannot be described objectively in any manner is crucial in reaching ethical

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decisions regarding mental health issues, as well as increasingly polarized and politicized medical issues concerning personhood, such as abortion. Another is understanding the rapid development of Artificial Intelligence (AI), and how we can determine if AI could ever become conscious. David Chalmers, who essentially pioneered the Hard Problem of consciousness, also used a series of criteria to evaluate large-language-model consciousness (Chalmers, 2023), a scarily relevant topic in both modern phenomenology and ethics. What if AI already is conscious? Would we utilize it any differently? We can always attempt to use some theories of consciousness to answer those questions. As phenomenally conscious individuals, possessing self-evident minds and possibly interconnected bodies, even if we are unable to quantify our subjective experience, we consistently produce problems that compel us to keep trying.

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Graduate Students at York University

Eileen Dadashi



Tuesday, February 10th, 2026
Interviewed by Sadaf Yarmohammad

S: Can you please introduce yourself, what program you are in, your year, and what degree you are pursuing?

E: Okay, my name is Eileen. I am in my first year of my master's thesis in biology and I am getting my graduate diploma in neuroscience.

S: Can you please tell us what your academic journey looks like? What led you to where you are now?

E: So I did my undergrad at York in biomedical sciences. I did a minor in psychology. When I graduated, I spent two years working in clinical trials at North York General Hospital. So I was a research assistant/coordinator. I started off just helping people with their studies and then had taken the lead of a couple by the end of my second year. I still worked there very casually, but then I decided that I wanted to get my master's after years of working in clinical trials, because you can't run your own studies without having a PhD. So I wanted to do research on my own and get my own ideas out there and learn more than just data collection and ethics. So that's what I did, and now I'm doing my biology masters.

S: And after your biology masters, do you plan on potentially doing something like a PhD?

E: Yeah, that's the goal so far. I want to see what I'm interested in first of all, because to get your PhD, you're basically just hyper focusing on a very niche topic for like four or five years. So I want to make sure that what I'm studying is something that I genuinely care about. And the world of neuroscience is very, very large. There's so many things that you can study and there's so many things that you can do. And right now I'm still kind of looking at neuroscience through a pinhole.

S: What do you hope to specialize in with your PhD?

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E: I don't know. It’s okay, one step at a time. Yeah, literally one step at a time.

S: A masters is already really huge. You started this year, correct? How has that been?

E: Yeah. So for biology, it's not as course heavy. You do have to take a couple of courses, but like now I've finished all of my course requirements. And I am taking a bio neuroscience graduate diploma. So that requires you to take two courses. And those courses also go towards your biology masters. So technically, I'm all like course out. And so I took two neuroscience courses, one last semester and I'm doing the other one this semester. And it's just, it's not really lecture based, it's more like people are presenting papers. And we kind of bounce ideas off of each other and get to work on our presentation skills and get like us ready to defend in a way. We learned a lot about neuroscience, as I was saying, there’s so much to learn about it. So when you're learning the most recent papers, it's fun. But I am also getting a lot of experience now in things that I've never thought I needed experience in. Like coding, which is fundamental. By the way, guys, if you didn't know, you need to know how to code a lot of statistics. So that's kind of been like my first semester– I’m just figuring out what I want my research to look like and what kind of project fits with the lab that I'm working in to kind of do something that interests me, but also benefits my lab, you know? I also didn't know that coding was going to be such a fundamental part of the path to academia. Take your stats courses now, guys, and take the advanced level stats. I am telling you that no matter what you want, if you want to be a doctor, if you want to go on to any kind of graduate course, take those courses.

S: If you're comfortable sharing, why would you recommend studying neuroscience– what' s its main appeal factor?

E: Well, I think the appeal factor for me is that it's so new in the field of research and it's incredibly relevant to our everyday lives. Like me personally, I'm not really interested in the clinical side of neuroscience. Like I've done it, I've seen it, and it's very important, there's no doubt about it, but for me, it's not what interests me. What interests me is the fact that we really don't know much about the brain, as you guys know, and it's so interesting how we're also using the knowledge that we have now and incorporating it into like machine learning like AI and all that kind of stuff and how it's become so relevant in our everyday lives, but not many people really know it. Like people just know in terms of like, oh yeah, the neural network, but do you really know what it is? Like I don't even really know what it is. And it's just something that's incredibly interesting because it's so multifaceted. Like it's not only like computer science and all of that, but then in the clinical side of it, but there's so much to know and it's so physical and there's like even it connects to like physics and math and like everything, and it's just one field of study and it's us. Like it's literally us. It's trying to understand how we work, the way we work, and it's so incredible to learn these things and then go about your everyday life, trying to pretend like it's not an absolute miracle that we're able to do anything. Anyways, I love neuroscience guys. I'm sure you do too. I think it's really awesome. Yeah, and you can really do so much. Like if you want to go into academia and study

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neuroscience, there's so many ways that you can incorporate whatever your niche is into the field of neuroscience and I think it's important for us to understand how we operate in whatever we do. I'm sure you can find a reason that it's important for you.

S: Are there any personal reasons or motivations behind your interest in Neuroscience? If you prefer not to answer this question, there is no pressure.

E: Yeah, I mean, I grew up in a family of medical professionals, like all my life. So my mom's an anesthesia assistant and my biological father's a doctor and my stepdad's a neurosurgeon. So I've just been absolutely engulfed in medicine forever. But out of all of these things, I guess neurosurgery was always the one thing that I'm like, wow, that's really cool. So as a kid, I was always like, damn, yeah, my dad goes into people's brains, you know, and then I was just kind of trying to have those conversations with him as a kid and then like really getting really curious about his field of work. And for the longest time when I was young, I wanted to be a neurosurgeon too, until I grew up and I realized I don't really like medicine. That's not my thing, but I still really do like neuroscience. I mean, the biggest driving factor is my stepdad in why I even was interested in neuroscience. Now what to do in neuroscience? It took me a while to figure out, but we're here now.

S: Kind of going back to your masters, I was wondering if you're currently conducting any research and do you have any specific studies that require volunteers?

E: Yeah, so not yet, but eventually. Right now I'm still kind of like the testing pilot. I'm saying the pilot is generous, honestly, like it's really like we're just going in the lab and just trying different things to see like, oh, what's actually going to work for my specific paradigm? But hopefully in the summer, data collection is going to begin and I definitely will need help. I can give you guys a brief rundown of what it's going to be. And I mean, from my specific project and paradigm, even if you know exactly what's going to happen, it's really not going to change anything. So that's the good part. Because then I get to explain to people my project before I hook them up to like a bunch of machines, so they know what the hell is going to happen. In our lab specifically, we focus on eye contact and gaze behaviors. So, for my project specifically, we're going to be looking at different depth cues that occur when you're having communication. So when you're talking to someone in real life, you're kind of aware of the space that you're in, and you're in agreement of the space that you're in, meaning that like, you understand the distance between each other and the distance between each other will always be in agreement. Because if person A is here and person B is here, person A can change their position, and person B can still agree on the relative distance they have between each other, and depth cues with change accordingly. And what has been found is that in online communication, these depth cues that we have in in person communication are completely shattered, basically. And that's because we're not in the same spatial consistency anymore. Like, I'm in my room, and I have no idea where you guys are. And I mean, we also blur the background. So there's really kind of sitting in this like 2D space, where you have no depth

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cues, but we also have zero eye contact ability, right? So if we want to make eye contact with each other on zoom or FaceTime or whatever, it's virtually impossible. Because if I want to make direct eye-contact with Hana, one of your eyes, I have to look directly into the camera. Right now it looks like I'm looking into your eyes. But for me, I'm looking into the camera. So I'm not really seeing your eyes. Even if right now I will focus on one of your eyes. It looks like I'm just kind of tilted down and I'm not really looking at you. So eye contact is diminished. And in our lab, what we're going to look at is going to be how this loss of depth cues and loss of eye contact affects us on a physiological and cortical level. So there's already been research that's shown that you're kind of losing this physiological arousal, physiological arousal being like your physiological arousal being the autonomic responses your body makes, such as your heart rate, pupil dilation, and skin conductance. So how much do your palms sweat? Basically, that is impacted when you're on zoom. And more research has shown that you lose cortical synchrony, which is something that occurs in in-person conversations where two people when they're having eye contact, not even just conversation, just pure eye contact will exhibit cortical synchrony. And hyper scanning, which is becoming really popular now as well, which is something I'm hoping to implement, has shown that you don't get this synchrony in an online communicative setting. So first, we're going to be looking at that, looking at an in-person conversation, sorry, we're just going to do an in-person volitional eye contact experiment where two people are literally going to come in, look into each other's eyes for like a set amount of time, look away, look back into each other's eyes, look away, we're trying to figure out how the time periods in between that, that's kind of what we're kind of like trying to figure out. But basically, two people making eye contact with each other, there's going to be one an in-person and then one over just like a zoom screen in front of you. And then we're going to see if that's going to have an effect. Most likely we're predicting that it will have an effect since previous literature has shown it. And then phase two or our second experiment is we're going to be using our own avatar based communication platform, which is called “DEEP”. And this avatar communication platform, what it does is it fixes the diminished depth-cues and gaze direction. So essentially it makes it so that the camera that's up here is going to be actually on your face. So it looks like it's giving that perception that we are making eye contact. And it also restores depth cues, which is one of the things that we're trying to say is actually the important part. So we're going to be looking at those different things and then seeing if restoring the depth cues and those that eye contact will restore cortical and physiological synchrony as in-person eye contact.

S: Just out of curiosity, are you doing this in conjunction with Kristen Lott?

E: Yeah, she's like, I'm taking her entire paradigm, basically. She's the PhD student in our lab. Literally the biggest difference between my work and her work, is the cortical and physiological synchrony as well as volitional eye-contact aspect.. which she wasn't looking at. And for her, it's a little bit more difficult because she had it in a natural conversation, no setting. So which is also, it's got its advantages that you can really apply it to a real life circumstance. Whereas for my study, it's like, do you really get an everyday situation where you make eye contact with someone and

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then look away and then make eye contact… repeatedly? Like you don't. But the benefit with my study is that we get to look at those events, kind of like with a microscope. We're going to get a bunch of those events from a bunch of different people and be able to say genuinely, that eye contact spiked skin conduction if there was a cortical synchrony. But I'm so lucky that she did this experiment, because I basically just took it and I reworded it–not plagiarism though. It's a different paradigm, we're helping each other. I think that is amazing.

S: Out of curiosity, did you know what you were exactly going to get into for your masters or did you have other topics of interest that you were initially leaning on?

E: Yeah, actually. So before I even learned about the stuff that we do in the biomotion lab. So my supervisor is Niko, same as Kristen, which is great. Before I reached out to Nico, I was mainly looking at doing work with like, how do you say it? Like neurodegenerative diseases. In the beginning, that's what piqued my interest. Because again, I was working in clinical trials. So all we had were clinical studies all the time, right? So for me, I was like, that's all I really knew in terms of neuroscience, because my background was also biomed. So for me, it was more like proteins and cells. And I was just fascinated by the fact that the brain even does degenerate. I'm like, what the heck is happening there? I understand that as you get older your brain stops working. But why does it stop working? Like, that interested me. So I was like, okay, I want to get into this. So I started reaching out to professors that I knew did like research on degenerative disorders, such as Alzheimer's and Parkinson's. And the more I looked into it and the more I like talked to the different professors at York, at UofT. I started realizing that the work didn't really interest me. And for me, I'm like, you know, that's not, that's like, it's interesting, but it's not just my thing. So at that point, I was just like, okay, you know what, I'm just going to start reading professors' papers and see what interests me. So when I first ran into Niko, his work interested me, specifically with biological motion. So the name of our lab is Biomotion Lab. And he focuses more on visual perception. I was thinking of doing my thesis on perception, like how different types of illusions work. Like, why do we perceive illusions? And I was thinking, maybe I'll do my thesis in this, but I knew when I talked to Niko, and Kristen, I'm like, okay, the visual perception stuff is relevant to our day and age. And it's really interesting. So then when I went into it, I didn't really have an idea of what was going to happen, but I knew it was going to be vision related. Niko and I were talking about incorporating more of a neuroscience edge to it, rather than going down the psychology route, it's a blurry line, honestly, like psychology is neuroscience. I get it. You can't really distinguish the two, but I guess I wanted to do more of like the actual cortical aspect of neuroscience than just pure psychology. And I feel like this is a good blend of the two. I did. I mean, it all sounds very, very interesting. And I think, yeah, there's definitely a bit of an integration with psychology and neuroscience. I think they're both very, very similar, but neuroscience is just so interdisciplinary. So we see a little bit of everything in it. It's nice to have the opportunity to kind of specialize in a field in neuroscience.

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S: Do you have any advice for students who are looking to take a similar path as you?

E: Honestly, for me, I would say take that gap year. If you don't know what you want to do yet, if you're not completely convinced of the research that the professor that you're currently with is what you want. Take that gap year. A year sounds like a lot, but at the end of the day, it's probably one of the best things you can do for yourself. You can take that time, really start talking to different people, go to different universities, and really see what your passion is and where your passion lies before you make that commitment, because a master's degree is a lot of commitment. And a PhD is even more commitment, like it might just be like, yeah, it's just two years and you get a master's, but if you don't really, you know, if you're not really passionate about the master's–that's going to be your life's work. Like honestly we're young, but that's our life's work really. So you've got to really love what you're doing to even be able to produce something that's worth reading, honestly. Take that gap year, take your time. I took my time and I'm very happy that I did, because if I didn't, I don't know where I would have been. It would have been a different path. I don't think it would have been a bad path, but at least I'm very satisfied. Yeah, and I think our 20s are very young. So taking that time to really kind of understand and figure out what you want is so crucial. I'm like, what could work? Work a big girl job, big boy. A grown job is a humbling experience. I will not lie. Like I was genuinely like, I came out of university and I'm like, I'm an adult now.I can do whatever. No, I could not. I immediately felt like a baby again. I'm like, oh my goodness. And you really learn what you don't want to do with your life when you start working. Like university is an amazing place to be, honestly. Like you are constantly learning. You're just curious. You're surrounded by people who are so passionate and so lively. And then you get into the workforce and you start to see people living lives that maybe you don't want to live or like you see someone who's living life and you're like, oh my god, that's exactly what I want to do. How did you get there? So work, take your time. Academia is a huge commitment. It's a big commitment, honestly. You don't get paid very well. And you spent a lot of time doing it. So if you don't like it, you're screwed.

S: Is there anything you wish you had known as you started your undergraduate studies?

E: At the end of the day, I was very happy with the decisions that I made personally because I felt like it benefited me. But I guess also like in my first year, I was still very hyper focused on a single career path. And it took me like a good second to like, you know, work and volunteer and talk to people before I realized that it's a much bigger world out there than I thought. So probably for any first year student or anyone in university, I'm still really young. So like, I don't think I'm like the wisest person in the world, but honestly, keep your options open and really start looking in places that you might not think you would end up like if you're so passionate about one thing, go for it. But if you've got doubts in your mind, I don't say to be doubtful and follow your doubts, but to follow your curiosity. You know, let that curiosity take you places because honestly, okay, at the

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end of the day, anything that you end up doing will be something that you will do most likely for the rest of your life. It's never too late to change your path. Like we're so young right now, like there's so many roads to go down. It is never too late to change your path, but look down on these paths before you're hyper focused on one, which is what I feel like I was like in first year until I started realizing maybe it's not for me.

S: Are there any interesting lessons or facts that you learned during your research journey that you feel welcomed to share to all the readers?

E: Yeah, I mean, I did mention this before, but honestly, guys, coding and stats. Wow. That's a lot. Like that's like, you need an entire degree on this stuff before you start doing research. Like, and it is honestly interesting. Even as an undergrad, I'm like, oh, I have to do this now. Like that's not what I want to do. I want to sit and I want to think of cool questions to ask. You know, but if you really get down to it, research is literally all stats. Like you need the numbers, you need to understand how these things work. And that is important guys. Math is like everything. Research in itself is so interdisciplinary. Like in our lab specifically, it is very computer science heavy. And we're really lucky to have incredibly like intuitive computer science researchers in our lab as well. It really helps those of us who don't have a computer science background, which is great. We have like Kristen in psychology, I'm in biology and we have computer science master students–all three of us will sit in a room and we will be talking about the same thing differently. And it's so incredible how much you learn about different fields. And the thing is I'm sure different labs have different people. Like I'm sure there's a lab that has a neuroscientist and a physicist working together. Like that is not out of the realm of reality. It's really an incredible opportunity to work with someone who has incredibly different training from you. You know, like to be able to use your knowledge and their knowledge in conjunction is a privilege. And it's very interesting. Yeah, I think being in environments like research labs where you're kind of meeting people who have completely different backgrounds of studies and you're all collectively working on a single project together can bring forth lots of really interesting ideas.

S: Do you have any final important comments that you would personally like to make that you think our readers would be very interested in knowing?

E: Final important comments. Well, I'm assuming a lot of people who are reading this are probably going to be interested in research. My biggest thing is if you're interested in research, go for it. You got to go for it with everything that you got because I don't think it's an easy field to generally be in and to really "make it", whatever that really means for you. You got to put your heart and soul into it as you do with anything. Like if you want to go into medicine, dentistry, I'm just talking about like in the realms of like what we're talking about right now, you got to put in 110 percent into it. But with research, it's like, I get it is literally your life's work. Like you will spend all of your time, all of your energy into a single question. And you got to really care about that question. You know, the one thing is like you really have to want to answer it yourself. I've seen people like

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master students, PhD students, postdocs alike, and you can tell they're not really passionate about what they're studying. If you're not, you're not going to produce anything, not only worthwhile for other people to read, but even something that you're proud of. So even if the only person that reads my paper is my mom, that's fine because I know I'm very proud of this piece of work. So just be proud of what you do and make sure it's something that you care about. Don't do it. Don't do it just because you're like, I want a PhD or I want a master's because that's what my mom is telling me, or my dad. If you want to be a mechanic, that's freaking awesome. Go be a mechanic. But make sure you freaking care about cars. Passion, I feel like it's not an easy thing. Like I do envy a lot of people who are so passionate about the field that they're in whether it's like a law degree or a dental degree. And you're like, wow, like they want to do this forever. Good for them. Me, I still don't really know what I'm going to do. I just know like right now I'm quite happy with the place that I'm in. Passion is not really something that you can just say you have, you know, you got to genuinely want it. And even if you're not really passionate about anything, that's also cool. That's fine. You can be passionate about things that are not career related, which is also so okay. Be passionate about travel. Be passionate about dogs, or gardening. Just find it. Find a passion. That's the meaning of life.

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Research at York University



Is Your Baby 3-6 Months Old? Are you looking for something fun and educational to do together? We would be happy to have you join us for an EEG session at York University. Our study involves your baby looking at wallpaper patterns on a screen while wearing an EEG cap.

We also provide compensation, parking, prizes and a picture of you and your baby!

If you're interested in participating, please scan the QR code (or the following link) to find our participant intake form and we'll be in touch!



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Neuroscience Seminars at York University

CIAN Seminars: Dr. Sabine Muzellec

Friday, February 6th, 2026

Written by Valentina Dodaro

The beginning of February marks a new month of the exploration and discussion of breakthrough research in the world of vision science. Dr. Sabine Muzellec received her PhD in Computer Science from the University of Toulouse, France (in collaboration with Brown University, USA). Her doctoral research is focused on the development of brain-inspired computer vision models that incorporate circuit-level oscillatory dynamics. Her more current research is focused on the development of biologically grounded models of visual processing in both neurotypical and neurodivergent populations.



Dr. Sabine Muzellec. Photo Credit: Noah Carson

Systems neuroscience is a subdiscipline of neuroscience involving the study of neural circuits and networks. It is these neural circuits and networks that are responsible for the complex behaviours, cognitive functions and perceptions our brains produce. Systems neuroscience relies heavily on large-scale computational models to understand how neurons give rise to behaviour.

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These computational models, artificial neural networks (ANN), are used and intended to predict brain function, but how do we know if these models accurately behave like the brain? ANNs are currently evaluated based on forward predictivity, a measure of how accurately features of ANNs can predict neural activity. This method is one-directional. Dr. Muzellec addresses this gap by introducing reverse predictivity. A system quantifying how well neural population activity predicts individual ANNunits.

This bidirectional framework was applied to the inferior temporal cortex of a macaque monkey and revealed representational mismatches that forward predictivity alone failed to detect. In addition to this discovery Dr. Muzellec uncovered that factors that improve forward predictivity such as optimising single-task performance and increasing model capacity reduced reverse predictivity. Avoiding this decline in overall performance and improving bidirectional predictability can be achieved by training ANNs with multiple, behaviorally meaningful tasks. Dr. Muzellec's discussion and results indicate bidirectional evaluation is advantageous and necessary during the assessment and development of brain-like ANN models. The inclusion of reverse predictivity to create bidirectional evaluation can guide the design of more biologically grounded models, ensuring a more accurate and comprehensive alignment between artificial models and real brain function

References

Muzellec, Sabine. (2026, February 6). *Can the Brain Predict the Model of the Brain? Rethinking Brain–Model Alignment*. CIAN, York University. https://www.yorku.ca/cvr/all-events/

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Neuroscience Seminars at York University

CVR Seminars: Dr. Kayrel Edwards

Friday, February 13th, 2026

Written by Diana Salami

The second talk of the CVR seminars was given by Dr. Kayrel Edwards. She is a Post-Doctoral Research Fellow and Connected Minds Trainee at York University. She received her BSc from the University of the West Indies and finished her PhD in chemistry at McGill University. Her current research examines the response of infrared optical devices to darker skin to improve their sensitivity for all skin tones. Dr. Edwards is very passionate about ethical technologies, therefore her research addresses challenges faced in equitable healthcare. Primarily, optical devices often overestimate oxygen levels in individuals with darker skin tones.



Dr. Kayrel Edwards. Photo Credit: Noah Carson

Skin tissues interact differently with light depending on pigmentation such as melanin. Melanin absorbs and scatters light, therefore higher melanin content indicates that more light is absorbed and less light is reflected. To figure out how skin tone affects measurements of oxygen levels in infrared optical technologies, Dr. Edwards recruited individuals from diverse ethnicities for her study. The first step involves objectively determining the participants' skin tone using a reflectance

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spectrophotometer as well as self-perception, perception of a rater, analytical instrument, and camera.

After classifying a person's skin tone, the study begins. Participants have their blood oxygen levels measured non-invasively using 5 different commercial optical devices simultaneously at rest and while walking on a treadmill with increasing incline. These devices include a smart watch with an oxygen sensor, a cerebral oximeter cap, and 3 fingertip pulse oximeters. There was an average 5% reduction in blood oxygen levels after a few minutes of physical exercise, measured by the gold standard Masimo MightSat™. However, other devices used in the study do not account for the level of melanin in the skin, and showed no change in blood oxygen levels during exercise. Therefore, they do not accurately measure blood oxygen levels of different skin tones. More especially. This shows that there is much work to be done with the commercial devices that people use. Industry manufacturers need to be aware of the skin tone bias of the infrared devices.

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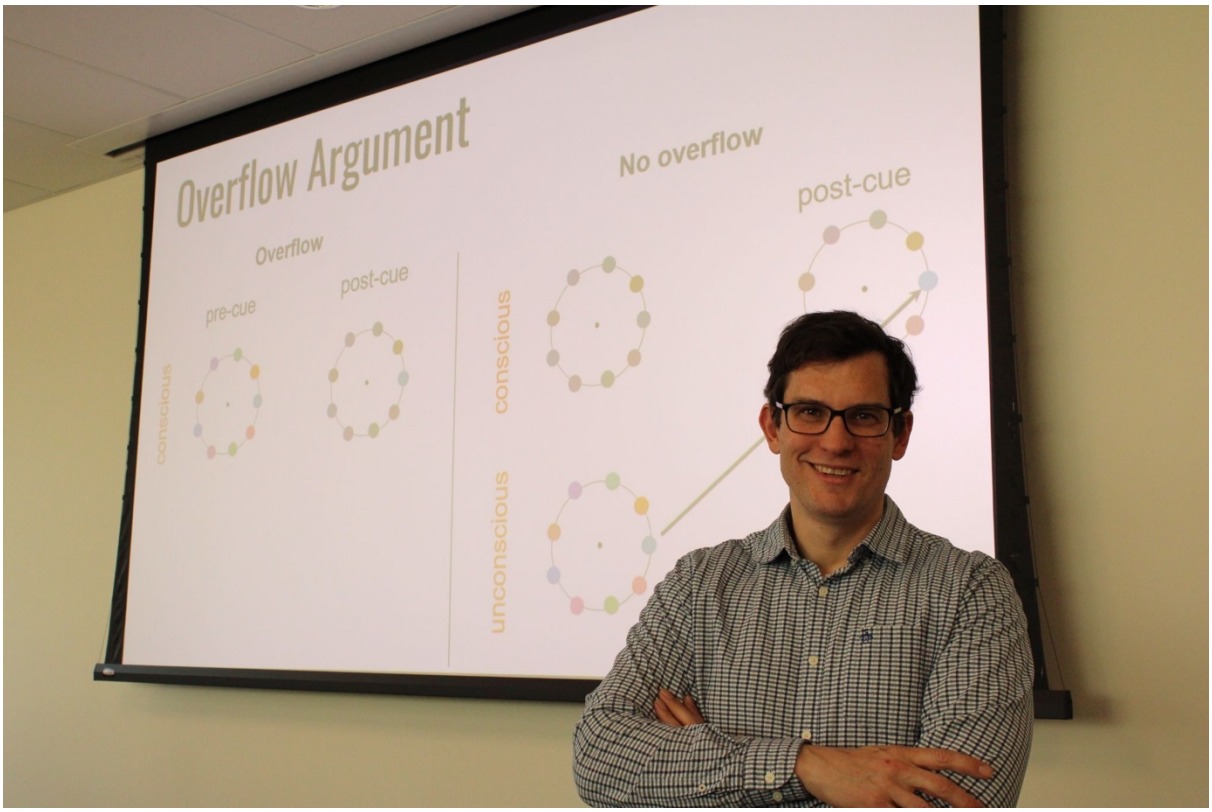
Neuroscience Seminars at York University

CVR Seminars: Dr. John Morrison

Friday, February 27th, 2026

Written by Diana Salami

This week's seminar speaker, Dr. John Morrison, is a Professor of Philosophy and Cognitive Science at Barnard College, Columbia University. His research involves these two fields by exploring how the brain represents and processes information, for instance in the hippocampus. His work often ties in computational neuroscience to uncover abstract philosophical questions about the mind. Dr. Morrison is also affiliated with the Zuckerman Mind Brain Behavior Institute and is an editor for the Journal of Philosophy.



Dr. John Morrison. Photo Credit: Denz Marieon Pasion

Dr. John Morrison's presentation explored how we store visual information in the split second after we see something, before it either fades away or becomes an encoded memory. In the 1960s, George Sperling's studies provided evidence for the existence of "iconic memory" which is a short duration, large capacity memory store for visual information.

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The limitation of Sperling's experiments, and others by researchers like Lamme and Loftus, is that they do not give a precise measure of iconic memory. Dr. Morrison's research introduces a new experimental paradigm to approach studying iconic memory, in order to investigate how much less precise iconic memory becomes over time. In his experiment, participants viewed nine colored dots arranged in a circle while their eye movements were tracked. After a short and variable delay, they were cued by a color and asked to look where the original dot was located.

This allowed Dr. Morrison and his team to measure feature precision (how close their response was to the correct location) and guess rate (how often participants were unsure of their response). Results across trials show that as time passes, memory does not fade fully. Instead, people's guess rate increases and their precision decreases. The implications of this data gives important insight into the precision of iconic memory.

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Opportunities and Events at York University

CIAN – Centre for Integrative and Applied Neuroscience:
A neuroscience research group at York University; its aim is to collaborate as a unit on subjects including, but not limited to health, education, and the industry.

Upcoming Seminars: (Kaneff Tower, Room 519)

- **Friday, April 10th, 2026 @ 2:00pm-3:30pm** | Dr. Carol Wilkinson, Boston Children's Hospital

CVR – Centre for Vision Research:
York University's specialized vision research organization that comprises of leading scientists and professionals who aim to conduct ground-breaking research and further develop training in this field.

Upcoming Seminars: (Kaneff Tower, Room 519)

- **Friday, April 17th, 2026 @ 2:00pm-3:30pm** | Marlene Behrmann, University of Pittsburgh
- **Monday, April 27th, 2026 @ 9:00am-4:00pm** | Undergraduate Neuroscience Capstone Presentations

Seminars are accessible to the general public; anyone is welcome to attend these lectures and ask questions.

Neuroscience Society at York University:



Women in STEM Mentorship Program

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A Grateful Thank You

This month's article, and the newsletter itself, would not have been made possible without the help of the following intelligent, talented, and passionate individuals who have dedicated time to present their original work and support the development of this month's issue. If you are interested in joining our team as we develop our issues for September 2026 and further, please access the google form on our website here. Members of all disciplines and backgrounds are welcome to take part in this initiative.

- **Diana Salami, Author**
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- **Denz Marieon Pasion, Head of Photography**
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