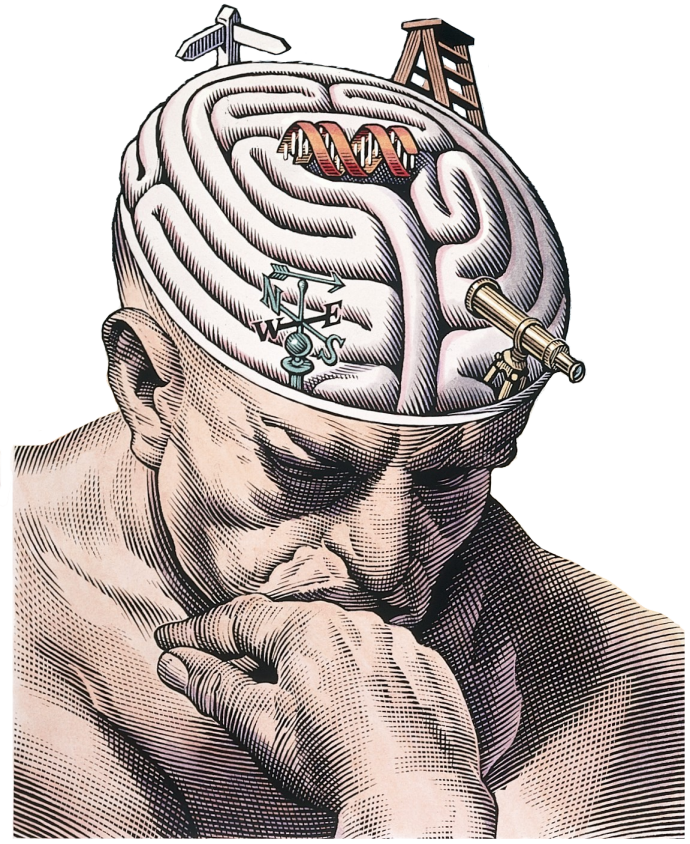
PENSÉE

Monthly updates from Cognitive Science

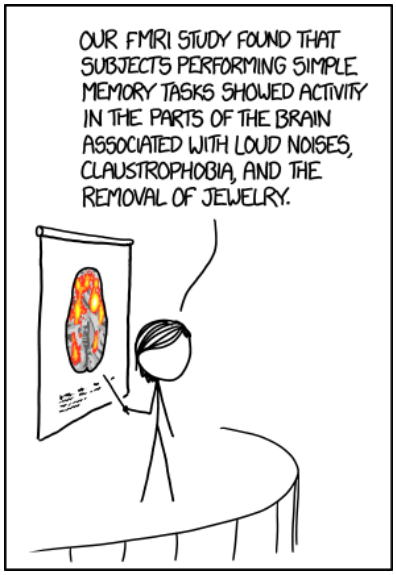
You hold, in your hands, the first edition of Pensée, a monthly digest of updates from the diverse, exciting and oft-overwhelming world of cognitive science.
Every month, we will bring to you some cool research, a CogSci gem to make your life easy, an interview with a researcher, and something you can watch, listen to, or read while you chill.
We hope you enjoy reading this newsletter as much as we enjoyed putting it together. We're always open to collaborations and criticism (or flattery). Feel free to write to us at penseenews [at] gmail [dot] com.



Gyri of the thinker's brain (Bill Sanderson, 1997)
Source: Wellcome Collection.

IN THIS ISSUE

fMRI, Dynamical Cognition, and Stupidity: Research Updates



Source: xkcd

- **Variability in the analysis of a single neuroimaging dataset by many teams**
  The Neuroimaging Analysis Replication Study (NARPS) asked 70 teams of researchers to analyze the same fMRI dataset to test the same 9 hypotheses. Although their initial statistical maps were very similar, the teams' final conclusions turned out to vary quite a bit. The findings ask us to reconsider the ways in which we analyze high-dimensional data and the extent to which such analyses can be trusted.
- **What Might Cognition be, if not Computation?**
  'The human mind is like a computing machine' - a statement that is gaining popularity as computational models of cognitive phenomena crop up everyday. In 1995, Tim Van Gelder proposed an alternative dynamical systems view. He challenged the Turing Machine analogy and the definitions of representation. For a critique of Van Gelder's stance, see Chris Eliasmith's paper.
- **The importance of stupidity in scientific research**
  This sincere essay by Martin A. Schwartz, Professor of microbiology and biomedical engineering, highlights the human aspects of science in acknowledging that a pursuit of doing good science does and should come with a degree of feeling stupid.
- **Lack of awareness despite complex visual processing: Evidence from event-related potentials in a case of selective metamorphopsia**
  This paper, in a tradition of important deficit studies, informs of the case of an individual R.F.S. who presents an inability to recognize, name, copy or understand the digits 2 to 9 (category-specific metamorphosia) caused by an acute neurological degenerative disease. This contrasted with his ability to recognise, copy, name and understand the digits 0 and 1 have tremendous implications in the science of visual processing and on the debate about generalisation-specialisation of brain sub-components.

Podcast

After Van Gelder and Chris Eliasmith's views on representations, hear Michael Rescorla talk about the philosophical aspects thereof. Tune into this podcast episode.

Digital Gem

Writing math equations in LaTeX can be annoying!
Make Python do it for you with the Latexify library (see examples here).

"I never had a sudden realization about what I wanted to do for the rest of my life"

Sharika is a Visiting Assistant Professor in the Cognitive Science IDP at IIT-Kanpur. She's interested in studying the neuroscience of pain and pleasure. Outside the lab, she enjoys reading, music, and long walks. We talk to her about her journey so far, her plans for the future, and building a career in research.

What is your academic journey leading to Cognitive Neuroscience? What are the issues that interest you?

Like all *good* students in school, I guess I was implicitly expected to take up either engineering or medicine. I loved biology, so the more automatic choice was medicine. I enjoyed premedical entrance coaching classes because subjects were taught in greater depth there. But I was not motivated to prepare for the MCQ-style entrance exams and joined Sri Venkateswara College at Delhi University for a bachelor's in biochemistry. My time there propelled me towards a career in research. I became interested in understanding the biology of the body and how it makes us the people we are. Till then, I didn't have a very clear idea of what neuroscience entailed , but I figured that to understand ourselves better, we needed to understand the brain.

I joined the Master's program in Neuroscience at National Brain Research Centre. Around the time when I had to choose a lab for my Master's thesis, I heard about the mirror experiment that had been designed to relieve pain sensations in phantom limbs. I realized what the understanding of brain and behaviour could potentially achieve. That opened my eyes to cognitive neuroscience! I joined Prof. Aditya Murthy's lab and stayed there to do my PhD as well. Following that, I did a post-doc in Michael Platt's lab at UPenn, where I got a chance to work with non-human primates to study social decision-making.

In my research, I want to understand how our environment and our emotions affect our behaviour, and the neural mechanisms thereof. Our environment includes the outcomes of our choices as well as things outside our control, like being part of a social set-up which is known to influence our actions, choices, etc. I'd like to probe the neural circuitry that controls or regulates all this behaviour.

Nowadays, there is a lot of advice for students on how they should build a career in research. What would you say to someone who wants to study cognitive science and potentially do research in the field?

I don't know if there is a 'one size fits all' answer to this. I can tell you what has worked for me so far. I routinely find myself asking – 'Is this what I really want to do? Does it make me happy etc.?'. The important thing is to identify when to take a call. I don't take decisions at the peak of a low mood phase when it is easiest to give up. I push it to a time when I can approach the options in a more balanced way. That's also because I believe that we need a diversity of personalities or thinking styles to inform our

science. Considering that not everybody is privileged enough to reach this far, I feel a sense of duty to keep pushing forward and not be derailed by setbacks – real or perceived.
You should also analyze the situation from your own perspective and do the next best thing. There are no laid-out rules or plans to achieve something. I never had a sudden realization about what I wanted to do for the rest of my life; it is a painfully slow and ongoing process. Do talk to people to get various viewpoints but don't assume what worked for them, positive or negative, will necessarily do so for you as well, if you follow their footsteps. Also, don't assume something is a 'failure' just because someone else views it that way. Come up with your own definition of what success means to you. As long as you can focus on finding out what motivates you and work towards reaching your own milestones, you'll be happy in your journey and that's what really counts.

This idea that doing a PhD in the West, particularly in the US, is better than doing it in India is a widely held belief. Then there is a divide on whether the European or US model for PhD is better. Based on your experiences, what do you feel is a good choice?
As for most things, there is no one correct answer. For me the question was 'can I do neuroscience here? And can I do it in this lab? Is this PI good enough for me to learn a few important things?'. From that perspective, I got lucky because the PI was actually good and I learnt a lot of new things in the lab. That might or might not have happened elsewhere.
I did a postdoc in the US and spent some time in the Netherlands as well. In my limited experience, I feel that life in the US is much more work focused than in the Netherlands, where I felt there was more room for a good work-life balance.
That apart, the key things that you get trained in during any PhD, are possible and the same everywhere. If a lab is well-funded and motivated towards asking good questions, there are a lot of things that you can learn, and excel at, in India as well. If your ultimate aim is to live abroad, probably the earlier you go, the easier it would be for you to get used to things. For your research interests, you should find a lab where you think you can pick up essential skills by working with a PI who has the time and resources to mentor you. Those things matter more than the country where you do it.

How would you describe your transition from being a postdoctoral researcher to now being a PI? As a young PI, what parts of it do you enjoy?
I joined in December and taught a course designed from scratch the following semester. I hadn't taught in a formal setting before, and to my surprise, really enjoyed this aspect of the job. I loved interacting with students and am looking forward to mentoring them on different projects in the future.

Finally, what do you like doing when you're not working (assuming it's not lockdown)?
In the last 6 months, I haven't really got a lot of free time to pursue hobbies. But I would love to catch up on some reading that has been pending. I enjoy music, singing, playing some banjo. I also like listening to live music and was hoping to attend some of the student-run concerts here on campus. I also enjoy watching movies and going for long hikes. In fact, one of the reasons we chose IIT-K is because of the campus, the greenery and the quiet. I'm hoping we will get to do more of that once the lockdown is lifted.