

## Patterns of research

### Interview with Shaun Gallagher<sup>57</sup> (Part II<sup>58</sup>)

by Przemyslaw Nowakowski & Witold Wachowski  
The interview was realized in January 2014.

#### **What are the most appropriate questions in cognitive science as well as in philosophy of mind, in the second decade of the 21st century?**

I think that cognitive scientists have to question their own reigning assumptions about how the brain works. There is a lot of hard data to look at, and it's quite overwhelming sometimes to analyze it, but at certain points we need to come up for air and try to sort out what it all means. For me the important questions are about assumptions we make in interpreting the data. Do we frame our interpretations in terms of classical computationalism and representationalism, or connectionist models, or dynamic systems theory, or predictive coding, or some other model? This may look like I'm putting the entire focus on the brain, but I think the motivation for these questions comes from the more embodied approaches to cognitive science. If the body and environment play an essential role in cognitive and affective aspects of existence, then we may have to rethink our basic models of how the brain works. Do we really want to maintain the Helmholtzian idea that the brain works on the model of inference? When we look at the actual processes that are specified by the predictive coding view, for example, should we really think of them as inferential?

#### **How would you evaluate the current boom in predictive concepts of knowledge (in particular those inspired by Friston's works)? It is an interesting issue for us especially in the context of neurocentrism on the one side of the spectrum and explicit references to Varela's early works made by the supporters of these (predictive) propositions on the other. Do you think modern cognitive science too neurocentric?**

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Obviously the brain is one important element in cognition, as well as in other life processes. On the one hand, if you're a neuroscientist, then you need to be neurocentric in some sense. It would be odd advice to tell neuroscientists they shouldn't focus on the nervous system so much. We want them to gain as much knowledge about the brain as they can. On the other hand, I don't think that all of the other scientists who focus on cognition—developmental psychologists, experimental psychologists, linguists, roboticists, anthropologists, as well as philosophers—are overly focused on the brain. In this sense I'm not worried about neurocentrism in the actual doing of science. But let me add two caveats. First, cognitive neuroscience in general may be a bit too central-centrist—studying primarily the central cortical processes as if all answers should be found there. I think autonomic and peripheral processes are also important. I really like István Aranyosi's recent book on *The Peripheral Mind* (OUP 2013) and I think it should be widely circulated in the cognitive neuroscientific community. Second, I'm more concerned about neurocentrism in the popular media rather than in science itself. People, like Jan Slaby and Suparna Choudhury, who work in the area of critical neuroscience, raise important concerns about how all the cool things we are learning about the brain are covered in the media and are shaping the way the general public is thinking about human nature.

Going back to predictive coding and Friston's work, it's obviously important to understand the real dynamics of how the brain works. We've known for a long time that anticipatory processes are hugely important for perception and action. Neuroscientists like Berthoz have emphasized anticipatory processes in motor control; and in phenomenology we have Husserl's account of temporality with an emphasis on protention. Work in predictive coding, and as I understand it, Friston's work in particular, is important for providing an account of how neural processing participates in this larger and pervasive dynamic. But again there are questions of how to interpret what we are learning about such processes. I've tried to address this in my paper with Matt Bower (in *Avant*). Friston, and others, like Jacob Hohwy in his recent book on *The Predictive Mind*, associate predictive coding with Helmholtz's notion of unconscious inference. For visual perception, for example, it is assumed that since the brain has no direct access to the outside world it has to interpret or decode neuronal firing patterns that are generated by light hitting our retinas. Accordingly, the brain is seemingly inferring to the best explanation of what causes a particular pattern of neuronal activation. This involves figuring the probabilities based on current neural states of the system—a current state that is generated by prior experience. So how does this 'Bayesian' process work? It involves top-down synaptic inhibition based on an empirical prior—which means the organism's previous experience and context-sensitive learning. Predictions are then matched against ongoing sensory input. If there is

a mismatch, prediction errors are sent back up the line and the system adjusts dynamically back and forth until there is a relatively good fit.

Again, the question is how should we interpret this. That is, if this is literally what is going on in the brain—if we are talking about synaptic inhibition based on prior experience, and a dynamic process that involve prediction error correction, then it's not clear to me why we should think of it as a kind of inference rather than a kind of dynamic adjustment process in which the brain, as part of and along with the larger organism, settles into the right kind of attunement with the environment. What's going on in the brain is one integrated part of the dynamics that are not just inside the brain; they are transactional across brain and body and environment.

**What is your opinion about the nature and value of interdisciplinarity? Is this phenomenon a natural step in the development of knowledge?**

I'm a big fan of interdisciplinary teamwork in science. In previous centuries maybe Descartes could be expert in philosophy and mathematics and physics; likewise, Newton in physics and theology, and Locke in medicine, law, and philosophy; Hume in philosophy, economics and history; Adam Smith in economics and philosophy. And as late at the 19<sup>th</sup> century James could teach physiology, and psychology, and philosophy. There may still be a few geniuses who can claim expertise in more than one field, but given the high degree of specialization now required in these different fields, the rest of us need to work with others, and it often takes an interdisciplinary team to work on some questions. This can be difficult too, since different disciplines have different vocabularies and think about problems in different ways. But I always find this kind of interdisciplinary work to be a learning experience—one which involves a tension between maintaining standards in one's own discipline while trying to be flexible enough to accept some different ways of thinking about the problem that others bring to it. All such difficulties aside, I think the promise of interdisciplinary research is that it can bring different perspectives to bear on a problem. A good example—over the past two years I was involved in a project to study experiences of awe and wonder had by astronauts during space flight. This had never been studied scientifically before. The project involved neuroscience, psychology, and phenomenology, as well as linguistic analysis and hermeneutics. In the end we were able to report on the phenomenology of such experiences, but also on brain processes as they were tied to very specific environments (in this case, simulated space flight), and on the religious and cultural background of the individual subjects who participated in the experiment. The interdisciplinary approach gave us a much fuller picture, in different dimensions, than would be possible if we did just the phenomenology, or the neuroscience, or the psychology.

**In this regard, then, can you say more about the role of phenomenology in experimental research nowadays? Is the present situation of phenomenology, as some claim, a little disappointing? How important is its role in the context of neurophenomenology?**

I'm not sure what you mean by 'disappointing'. I would say it's a little different—that the situation of phenomenology is different than it was at the beginning of the 20<sup>th</sup> century. Maybe if some people think that it should be just the same as what Husserl proposed, then they may be disappointed. We are literally 100 years beyond the publication of Husserl's *Ideas*. For some people phenomenology is just the historical bit of philosophy developed by Husserl, Heidegger, Sartre, Merleau-Ponty, and so on. But phenomenology would be dead if that is all it was. Even in that history, Merleau-Ponty was already a far distance from Husserl, and I'm not sure that there is just one thing called phenomenology. On my view it would be sad if we were not using and developing phenomenology further. Certainly the original phenomenologists would be sad if what they developed was now just history. I'm optimistic that phenomenology is still relevant to both philosophy and science.

Neurophenomenology is one way that phenomenology remains relevant. The study that I was just describing is, I think, a good example of neurophenomenology. It involves a correlation between neuroscientific data and first-person phenomenological report—and more than that... (You can find a full account of the study at

<http://www.chdr.cah.ucf.edu/spaceandspirituality/publications.php>,

and some specifics about the methodology we used at

<http://www.frontiersin.org/Journal/10.3389/fnhum.2013.00608/full>)

In effect, this study would have been impossible without employing a phenomenological methodology.

**Your “A pattern theory of self” may be seen as a proposal aimed to integrate the research on the self. From our perspective, your division between the self-referential and the self-specific processes is fashioned into a kind of dispute between Northoff and Legrand on the neuronal basis of the self. Do you think that your inquiries follow the direction of Northoff?**

My idea was to try to provide a theoretical framework that could integrate research on self—I agree with that. In some regard I was trying to remain neutral with respect to how precisely anyone should think about the different aspects that constitute the pattern. In addressing Northoff's research I was suggesting that there was a way that it could find a place within this theoretical framework, without necessarily saying that I agree with the way that he characterizes the self. I think that Legrand (Legrand and Ruby 2009) offers

a critique of the kind of research that Northoff has done. Legrand and Northoff might themselves characterize this as a dispute. But I was again trying to indicate that Legrand's work also could find a place within the concept of a pattern theory of self. So I was suggesting that one could map both Northoff's research and Legrand's research into the broader and relatively coherent theoretical landscape of research on the self, and then be able to say some things about how they differ, without denying that there may be ways in which they are simply pointing to different aspects of self. Generally, from this perspective, I think that if someone would claim that their particular research on self captures all we need to know about self (and I don't think either Legrand or Northoff do this) then they would clearly be wrong. The question then is whether we can make different research approaches and conclusions consistent. Likely not; but the pattern theory may provide a framework in which we can work out such inconsistencies without ignoring the possibility that what is at stake is something much more complex. That's why I wrote that one "benefit of the pattern theory of self is that we can more clearly understand various interpretations of self as compatible or commensurable instead of thinking them in opposition" (2013a). But I also said that I didn't think this would solve all philosophical problems about self.

I wouldn't say that this moves us in the direction of Northoff. Indeed, I indicate that on my own view I think that Legrand and Ruby are right—and I point to a different paper where that agreement is reinforced (Gallagher 2012). But in the 2013 paper I wasn't outlining my own view, or my own pattern theory of self—I was proposing the concept as a neutral framework. Of course, the specifics that I included may in fact reflect my own biases in how I think of self, but if there are more aspects, or if one thinks that I offered too many parts to the pattern, then one can make the argument. I suppose the only way to disagree with that concept of a pattern theory is to say that the self is not a pattern at all, but just one thing that may or may not be one of the aspects I included in the pattern. And there are other interesting questions that can be explored. For example, what status does a pattern have—is it something real or something that is perceiver-relative?—important questions explored by Dennett (1991) and Haugeland (1993).

**Your research spans a variety of topics—from self and psychopathology to education. Which of these problems are in your opinion currently most important?**

I think a lot of these topics are interrelated, and I'm not sure I can say that one is more important than the other. You didn't mention intersubjectivity, and I think that is something that ties these other issues together, although they also relate in other ways. I think that if you focus enough on one topic it leads to the others. An obvious example is the connection between self and psycho-

pathology, something emphasized by phenomenologists like Josef Parnas in Copenhagen and Louis Sass at Rutgers. Many psychopathologies also involve problems with intersubjectivity. Self-identity is also shaped by intersubjective and cultural forces, and this would certainly include educational institutions.

**What is your opinion about social science studies on distribution of cognitive activity between human and non-human agents. We mean works by Bruno Latour, Michael Lynch etc. They seem to be of interest for some cognitive scientists, from Edwin Hutchins to Lambros Malafouris.**

Yes, I find them interesting too. I've been developing the idea of a socially extended mind, by which I mean that our cognitive processes are extended not only by technological means or the kind of hand-held devices that Clark and Chalmers, following Hutchins, talk about, or artifacts (Malafouris), or environments (Kim Sterelny), etc.—all of which I think are important and interesting—but also by large institutional practices (Gallagher 2013b). I've focused on the legal system—a cognitive institution that helps us to solve certain problems. But science itself, understood as a cognitive system, may be an even clearer example. Latour's work is certainly relevant in this regard. So I think understanding social structures and what institutions do to us, not only in terms of cognition and problem solving, sometimes enhancing our cognitive abilities, and sometimes distorting them or limiting them, but also as human agents who live in intersubjective and social arrangements. Institutions can also distort our human relations—so these are topics not only for cognitive science, but also for critical theory.

**What are your most important non-academic interests?**

My family—most important. I take a non-academic interest in them. My wife and two daughters are doing interesting non-academic things and I try to keep up with them. My mother and sister and her family live in Philadelphia, my hometown, and I don't visit them enough. Living in Memphis is very cool—the music is fantastic, so I've been getting more interested in that, which is a return to something I loved when I was younger. Beyond that, food, wine, the beach and travel.

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