



BERLIN
SCHOOL OF
MIND AND
BRAIN

An Issue on
CONSCIOUS AND
UNCONSCIOUS
PERCEPTION

Newsletter
N^o I
JUNE 2009

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by Michael Pauen and Arno Villringer

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Conscious and Unconscious Perception

This is the first in a regular series of newsletters that will profile the Berlin School of Mind and Brain.

Recent progress in the neurosciences has opened up new and exciting avenues for research that raise challenging conceptual and ethical questions that lie at the heart of contemporary research in the field of consciousness studies. The Berlin School of Mind and Brain offers a unique research and training environment for doctoral candidates to work at the interface between science and the humanities. Founded in 2006 as part of Germany's *Excellence Initiative*, the School offers a three-year interdisciplinary doctoral program in English. Of particular interest are research areas that fall on the borders between the mind sciences (e.g., philosophy, linguistics, behavioral and cognitive science, economics), and the brain sciences (e.g., neurophysiology, computational neuroscience, neurology, and neurobiology).

Hosted by the Humboldt University, and located in the heart of Berlin, the School has a faculty comprised of 60 distinguished researchers, which includes scientists from the Berlin institutions of the Free University, the Technical University, the Bernstein Center for Computational Neuroscience Berlin, and the Max Planck Institute for Human Development, as well as the Max Planck Institute for Human Cognitive and Brain Sciences (Leipzig), and the nearby universities of Potsdam and Magdeburg. ▶

Editorial
by MICHAEL
PAUEN and ARNO
VILLRINGER
Academic Directors,
Berlin School
of Mind and Brain

Students are strongly encouraged to develop and work on any projects that are relevant to interdisciplinary questions relating to mind and brain. They acquire a strong foundation for interdisciplinary work by attending eight one-week classes during the first half of their doctoral program, which cover all fields relevant for mind/brain-related research, and allow students to explore research methods and topics to which they have not been previously exposed to. In addition each doctoral candidate is assigned two professorial advisors – one from the brain sciences and one from the mind sciences.

Given a major research focus of the School is consciousness, we thought it highly appropriate to launch this newsletter at the ASSC-XIII meeting, and profile the work of some of our students who are most actively involved in exploring issues core to the modern study of consciousness. Naturally in such a format it is impossible to give more than a taste of the research being done. We encourage you to seek out the presentations by these and other students of the School at this meeting to get a fuller sense of the depth and breadth of the work conducted by our research community.

It is with great pleasure on behalf of the School to warmly welcome all attendees to the 13th annual meeting of the Association for the Scientific Study of Consciousness to Berlin. ●

Q & A

DANIEL
MARGULIES

Q *What motivated you to apply for the program at the Berlin School of Mind and Brain?*

A I visited Berlin a year and a half ago. While at a bar one night, I met a guy who suggested I contact Arno Villringer and look into the Berlin School of Mind and Brain. Everything from that point on flowed rather naturally. The flexibility of the program – that I could pursue a diverse line of research within the umbrella of the School, while also having the support to continue with neuroscience – was my ultimate motivation for applying. I also wanted to take the opportunity to learn German, which has thus far proven to be more of a challenge than expected.

Q *What is your research topic?*

A I study intrinsic fluctuations in brain activity using fMRI. The research explores the relationship between functional neural systems independent of a specific task and behavioral differences between individuals. I've had some interesting results looking at anterior cingulate connectivity with respect to how people deal with stress in their daily lives. We're also beginning to apply

these connectivity techniques to look at applications for neurosurgery. My other primary interest is in exploring how theories and methodologies from contemporary art can contribute to neuroscientific practice. I'll need to get back to you with details there. At the moment, it's just about as wishy-washy as it sounds.

Q *Which do you see as the challenges of an interdisciplinary study of the mind and brain?*

A Of all the challenges inherent to any spirit of interdisciplinarity, one of the lesser addressed is the difficulty of succinctly explaining to people (especially to oneself and one's supervisor) what one actually does. My close friends know about the intrinsic fluctuations. But given the artistic tenor of Berlin, I usually tell people that I'm a brain photographer – which I believe in some indirect way accurately conveys the interdisciplinary spirit the program. I tell my parents that I'm in medical school to make things easier for all of us. ●

Q *What classes from undergraduate study do you wish you could still remember or wish you had taken?*

A Although “The History of Paris Through its Architecture,” “Capitalism and Psychological Life,” and a course on the literature of the year 1871 have all been peripherally useful at some point or another, I feel an almost daily regret for not having taken more computer science and math courses during undergrad.

Q *What do your parents think you are studying?*

A See question #3.

Q *What do you like best about living in Berlin?*

A I like knowing that all official forms will arrive in the mail with two holes already punched, suggesting a nationwide organizational strategy that far exceeds my own cultural upbringing.

A Another thing I like about living in Berlin is that for every three activities which require signed duplicates as a rite of entry, there are another three which simply require one to know the entrance location, or the password, or the friend-of-a-friend. The city seems full of these tensions between explicit and implicit structure, between amorphous grass roots initiatives and bureaucratic hierarchies. Whether looking for a challenge or for comfort, it seems anyone could find a place here that feels right. ●



DANIEL MARGULIES



Q *What made you apply for the program at the Berlin School of Mind and Brain?*

A My research is motivated by the question “how do human beings constitute themselves as conscious volitional beings and shape their cultural habitats?” After having completed an undergraduate thesis in computer science, entitled “Can computers think”, and a masters thesis in philosophy, entitled “Free will, neurobiology, and the second person”, I naturally thought of getting my hands dirty with cognitive neuroscience experiments during my PhD. The Berlin School of Mind and Brain promised an intensive interdisciplinary teaching program, as well as an excellent collection of neuroscientists, philosophers, linguists, and psychologists with which to investigate the cognitive capacities, as well as the social and intersubjective skills, which go towards making a creature a person. In addition, the prospect of living and working in Berlin won the case against other interdisciplinary programs.

Q *What is your research topic?*

A Our volitional capacities largely depend on our ability to pursue long-term commitments and plans in face of distracting and demanding short-term tasks. How does the brain encode, maintain, and retrieve, future intentions and plans of action in the face of constant active engagement with other demanding tasks? I investigate these questions by applying multi-voxel pattern classification on fMRI neuroimaging data collected from subjects engaged in a demanding task which requires them to endogenously retrieve and execute goals during 50 second long trials. At the same time, with the help of my second supervisor, I am looking into the philosophical implications of my empirical work on theories of intentions and actions.

Q *Which do you see as the challenges of an interdisciplinary study of the mind and brain?*

A I see two major challenges for the interdisciplinary study of mind and brain. The most salient is a divide between a socio-historically embedded perspective on the mind and what it is to be a human on the one hand (i.e., one based on ▶

normative reasons and philosophical/historical/cultural narratives); and on the other a ‘bird’s-eye’ measuring/scaling perspective on the diverse dimensions of human behavior, traits, and experience. Strikingly, in attempts to bridge such a ‘gap’ by measuring and scaling cultural and narrative phenomena we run the risk of adopting a utilitarian attitude at the cost of dismissing other approaches and traditions of investigation. The second challenge is what I would like to call the challenge from experience. Whether in the jargon of ‘consciousness’, ‘qualia’, or ‘mindfulness’, it is embarrassingly apparent that we have not yet come close enough to what the ‘experience’ of being human (or any other conscious creature) is, how it comes about, and why it has evolved.

Q *What do you like best about living in Berlin?*

A I enjoy the thriving bedrock Berlin provides for independent currents in music, dance, and performing arts,

as well as its generous discounts and funding opportunities for students interested in art, sciences, and cultural events. On the other hand, the diversity of strong scholarly programs in the sciences and humanities in Berlin allows for fruitful interdisciplinary encounters and collaborations. Finally, exploring its history reflected in its architecture and cityscapes is a privilege, especially to the eyes of an amateur photographer. Since I have left my more populated and polluted home town Tehran, I have not felt as much at home in any other city. ●



IDA MOMENNEJAD

Q What motivated you to apply for the program at the School of Mind and Brain?

A After a bachelor's degree in cognitive science and a master's degree in neuroscience I looked around for a suitable doctoral program. Very soon I realized that most doctoral programs would require me to let go of either neuroscience or philosophy. But that did not seem the right thing to do. How could I be happy with a program that was bound to throw light only on one half of the questions I have, and deal with only one half of the issues I yearn to understand? I believe one can only progress fully from an integrated perspective on philosophy and neuroscience. Furthermore I did not want to miss out on the challenge and fun of such an approach. I wanted a program which makes the explicit vow of interdisciplinarity, and the Berlin School of Mind and Brain did exactly that. And that's why I applied.

Q What is your research topic?

A The topic I am interested in is visual object perception. Humans seemingly effortlessly recognize and categorize objects of all sorts under radically differing environmental conditions, but how the human visual system achieves this cognitive capacity is very little understood. How do we recognize objects (e.g., a chair, as a particular exemplar, and simultaneously as a member of a class of the family of chairs)? How is a unified and structured perception of the world as made out of specific objects that are category members possible? To tackle these questions I conduct research using fMRI and multi-voxel pattern analysis, analyzing the structure of object representation in higher visual areas in the human brain.

Q Which do you see as the challenges of an interdisciplinary study of the mind and brain?

A One major challenge is to access questions concerning cognition from different disciplines on a real par. This requires the middle way of not getting stuck in *a priori* confessions of belief of one's own discipline and at the same time not abandoning ▶

one stance or perspective for the lure of another. It requires first to reconstruct the way issues concerning the mind and the brain are posed, second to crystallize out well described, specific and clear questions, and third to take the endeavor of answering these questions long distance, creating a sustainable technology of research and debate.

Q *What do you like best about living in Berlin?*

A Berlin offers a vibrant cultural scene in philosophy, music, theatre

and dance. As the world is not a part of the brain, but the brain a part of the world, studying and living in Berlin is not contradictory, but complimentary. ●



RADOSLAW CICHY ◆



FRIEDERIKE HOHLEFELD ◆

Q *What motivated you to apply for the program at the Berlin School of Mind and Brain?*

A Since undergraduate study I have been interested in the connection between the life sciences and the brain sciences. How do software and hardware interact in the human being? In computer science a separation of both fields is unthinkable, whereas the gap between “mind” and “brain” disciplines is still striking. The interdisciplinary focus of the School bridges this gap.

Q *What is your research topic?*

A Movements are fundamental for daily communication. In the case of spinal cord injuries or neurological illness people can lose their ability to move and thus communicate. Such loss can be restored by using a brain–computer interface. This device relies only on the brain activity of the user, who can manage by just thinking about the goal, for instance, text spelling programs or move wheelchairs. I am working on the optimization of brain–computer interfacing by investigating how intention and decision-making are realized in the human brain.

Q *Which do you see as the challenges of an interdisciplinary study of the mind and brain?*

A A major challenge is finding a common language. The long isolation of the disciplines has generated specialized knowledge as well as different terminologies for similar things. The disciplines must learn to effectively communicate with each other by establishing a common language, from which further knowledge can be developed.

Q *What do you like best about living in Berlin?*

A Berlin scientifically offers a great platform for interdisciplinary work in the neurosciences and life sciences. The network of three big universities and various research institutions provide a good start for a doctoral student. Non-scientifically, Berlin is a melting pot of cultures, which continuously change the city’s face, while its core is determined by the intense historical background. ●

Q *What motivated you to apply for the program at the School of Mind and Brain?*

A During my earlier studies in psychology I did research on basic functions of the human mind and brain, such as action monitoring, both from a cognitive and clinical perspective. I decided to continue my research at the School because it offered the possibility to become familiar with other approaches, such as philosophy.

Q *What is your research topic?*

A I am examining the sense of agency: How do we recognize that we are causing our own actions and their effects? My research focuses on identifying the underlying mechanisms. For instance, how sensory and central information is integrated to give one the experience that when your hands turn a steering wheel that you are the source of that action. I currently use EEG to investigate the time course of the neural processes involved in the sense of agency.

Q *What do you find most interesting about your research?*

A There are forms of psychopathology in which the sense of agency is disturbed. In schizophrenia, for

example, patients with delusions of control describe the experience that their thoughts or actions are not produced by them, but made by an external agent or force. In order to explain the origin of these symptoms we need a better understanding of the basic mechanisms underlying the sense of agency.

Q *Which do you see as the challenges of an interdisciplinary study of the mind and brain?*

A The prerequisite for fruitful interdisciplinary work is to develop a common language and precisely define what each approach can bring to the topic. The role of cognitive psychology is to contribute elaborated theories and testable hypotheses about functions of the mind, which can then be validated using convergent evidence from neurophysiological or neuropsychological measurements.

Q *What do you like best about living in Berlin?*

A Berlin is a multicultural, open-minded and fresh city with many different facets. What I like most about Berlin is its lively and inspiring art scene. I am currently taking part in a modern dance theater project led by Marc Headley.

Q & A

KRISTINA
MUSHOLT

Q *What motivated you to apply for the program at the School of Mind and Brain?*

A Given my interdisciplinary background (I have master's degrees in both neuroscience and philosophy), working towards a doctorate in philosophy within the School's program almost seemed like the logical continuation of my education. It enables me to focus on my philosophical interests while at the same time staying in close contact with the empirical sciences and acquiring

additional knowledge in areas that I was not previously exposed to, such as linguistics and computational neuroscience. In addition to the interdisciplinarity of the program I was attracted by the internationality of the School.

Q *What is your research topic?*

A My research topic is self-consciousness; that is, I am trying to understand how we come to have ▶



ANTJE GENTSCH ◀



KRISTINA MUSHOLT ▶

a sense of self, of being distinct entities in the world. I am particularly interested in the relation and transition between implicit and explicit forms of self-representation and the role of intersubjectivity for self-consciousness. In other words, I am interested in the interdependence of our sense of self and our sense of others. Apart from the fact that I find questions relating to our sense of self deeply fascinating, I also like combining different methodological approaches in my research, for example, by using insights from analytical philosophy, as well as from phenomenology, cognitive neuroscience and developmental psychology.

Q *Which do you see as the challenges of an interdisciplinary study of the mind and brain?*

A In my opinion one of the biggest challenges of interdisciplinary research consists in the different perspectives and the different languages that are employed by different disciplines. Often, researchers from different areas use the same expression to refer to entirely different concepts, which can make it difficult to communicate effectively. This is why I think an interdisciplinary edu-

cation is important. Also, I believe that while there are many issues that call for an interdisciplinary approach, we should not forget that sometimes, different disciplines simply ask different questions, each of which has their rightful place. In other words, we should resist the temptation to confuse cooperation between disciplines with the reduction or elimination of certain approaches.

Q *What do you like best about living in Berlin?*

A What I love most about Berlin is the sense of creativity, constant transformation, and liveliness in combination with a certain weight that the history, which is visible everywhere, imposes on the city. In my mind, this creates a fascinating dynamic that is matched by few, if any, places in the world, and that is very inspiring. I also love the fact that Berlin is an incredibly tolerant city – it feels as though no matter who you are or what you do, there is a place for you here. ●



CONTACT

If you would like to talk to us about research at the Berlin School of Mind and Brain and our doctoral program, please get in touch!

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