

## Editorial

Dear Readers,

With this "Brainstorm", the editors proudly present the third issue of the Newsletter of the NCP study program. The present edition places particular emphasis on the 'new' cohort of students (pages 2-4). Further, given that the CHE recently evaluated the Department's Master and PhD programs as being "masterly", the Editors felt it apt to include some of the results of this evaluation to the current Newsletter (page 8). Because only two out of five Master courses are currently running at the Department of Psychology (including NCP), and a PhD program (MCLS) has been established only very recently, the Editors believe that NCP made contributed very substantially to the positive CHE evaluation. The Editors would like to say thanks to all those, teaching staff and students alike, who have made the Department in general and NCP in particular "masterly".

### EDITORIAL COMMITTEE

Thomas Geyer

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# The Brainstorm

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## NCP welcomes new cohort



In fall 2009, a new cohort of 17 students commenced their studies in NCP. Twelve (out of the total of 17) students have come from abroad, with countries of origin ranging from Columbia

over Kosovo to Syria. 76% of the students have a background in psychology and the other 24% in different disciplines, including Clinical Linguistics, Communication Sci-

ences, and Statistics. Almost all the students found out about the NCP program on the internet.

Almost all new students embarking on the course have plans to go into research and do a Ph.D. afterwards (see also next pages). While on the course, well over half of the students would welcome the opportunity to undertake one of their obligatory research projects in a partner lab abroad.

We wish all new students enjoyment of and success with their course!

## Munich Center of the Learning Sciences opens

The newly established Munich Center of the Learning Sciences (MCLS) has been officially opened on July 13th, 2009.

The MCLS is a center at the Department of Psychology and Educational Sciences of LMU Munich (coordinators: Frank Fischer, Rudolf Tippelt, and Hermann Müller), integrating research efforts and offering teaching contributions from a variety of LMU Departments (chiefly Psychology & Educational Sciences, but also Mathematics, Computer Science, Medicine, etc.), as well as 34 research institutions/groups in the Munich area (e.g., the Max-Planck-Institute for Psychiatry, the German Youth Institute, the Technical University of Munich). At the core of the MCLS are eight interrelated



Center Initiatives (for further information see [www.mcls.lmu.de](http://www.mcls.lmu.de)), encompassing the broad range of themes within the Learning Sciences: *From Cortex to Community*. Two new teaching programs (Master and Doctoral program), supported by two new professorships (to be advertised shortly), have been established within MCLS; the teaching language is English.

Future plans concentrate on a collaborative research projects, including a proposal for the establishment of an LMUexcellent Graduate

School of the Learning Sciences within the next round of the Federal Excellence Initiative. This is to facilitate a sustainable high-level, research-based education in the Learning Sciences meeting international standards.

### Content

- ★ Interviews: Michael Zehetleitner, Paul Taylor & Iris Wiegand (p.5-7)
- ★ Evaluation: Results for the Winter Semester (p.7)
- ★ NCP Students Abroad (p.11)
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- ★ NCP Students Poster Presentation p.10)
- ★ CHE Evaluation (p.8)

# NCP's New Cohort



**Iyad Aldaqre**

**Why I applied:** Neuro-psychology is the field that I am interested in the most for my master-degree, and it is not so ubiquitous, but, gladly, Munich is a good choice.

**Future goals:** To deepen my knowledge in the field of learning-disabilities, from a neuro-psychological perspective.



**Lucie Wink**

**Why I applied:** The NCP-programme offers students from various backgrounds a specialized Master's programme to become researchers in Neuro-cognitive Psychology.

**Future goals:** Critically assessing psychological therapeutical methods from a neurological perspective.



**Antonia Conti**

**Why I applied:** I chose NCP because it is a high quality educational program, leading to international experiences and beyond the classroom education.

**Future goals:** The future is always so difficult to discuss in detail, however, I would like to pursue a PhD in neuropsychology and possibly work in a rehabilitation facility. Whichever future project I decide upon, it is fundamental to me that the research I am involved in is aimed at understanding the human condition and in improving quality of life for others.



**Renata Dombovits**

**Why I applied:** I came to NCP because I find the program interesting and helpful for my carrier.

**Future goals:** My future plans are phd and a clinicial psychology job in a hospital.



**Lukas Cerny**

**Why I applied:** I've applied to NCP due to its reputation amongst Professors I already work with and because I believe that brain-based research is the way to go in the future.

**Future goals:** Once the master is over, I plan to do a PhD, work in as many countries as possible and ultimately settle in a nice research institute in Canada (Montreal and Toronto are currently high on the list).

María F Gutiérrez Herrera



**Why I applied:** One of the things that attracted my attention was the possibility provided by the NCP Program of receiving training in using diverse methodological tools employed in experimental psychology and cognitive neuroscience. I consider this training mandatory for expanding my understanding on the different possible approaches to the study of higher mental functions.

**Future goals:** After finishing the NCP program I would like to work in the clinical field of cognitive neuropsychology. I'm interested in the assessment of neuro-cognitive functions as well as in the design of cognitive rehabilitation models.

Satja Mulej-Bratec



**Why I applied:** I applied to the NCP program to acquire a broad-range theoretical background in the areas of cognitive psychology and neuroscience, and to gain valuable research experience in my areas of interest.

**Future goals:** My future goals lie in the academics, more specifically doing a PhD after finishing the NCP program, and then probably continuing with research.

Manuel Schröter



**Why I applied:** The decision to start my master's at the NCP program is based on the hope that the growing neuroscientific infrastructure in Munich (Graduate School for System Neuroscience, Munich Neuroscience Center etc.) will provide me with a good network for my future research and that NCP will set an integrating framework for my multidisciplinary background by excellent education in psychological and neuroscientific methods and theory.

**Future goals:** I plan to do a methodological-orientated PhD on the interface of communication-, network- and neuro-sciences.

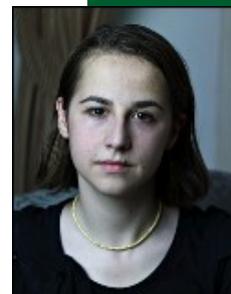
Anna Klapetek



**Why I applied:** The reason for which I chose NCP is that I believe it can help me acquire the necessary theoretical and methodological background as well as enough practical lab experience to be able to apply for an internationally recognized PhD programme.

**Future goals:** In the future I would like to pursue a career in cognitive research, probably studying multisensory integration.

Francesca Bocca



**Why I applied:** I decided to apply for NCP because it offers both strong theoretical basis in neuropsychology and many opportunities to improve my research skills.

**Future Goals:** I wish to pursue an academic career, I'd also like to teach Psychology or Cognitive Science at some University, it would be a really challenging experience.

Sebastian Urchs



# NCP's new Cohort



**Naim Telaku**

**Why I applied:** I come from a very theoretical background in Psychology, a background that wasn't much convincing and fulfilling to me. I have been looking forward to an experimental approach to psychological phenomena (cognitive processes), an approach that could make scientific conclusions and predictions. In this respect, NCP sounded like the best option from the options I had.

**Future goals:** In the near future I envisage myself doing research in the field of theories of mind and executive functions, may it be within a PhD program or something else. In the far future, I see myself as a teacher and researcher.

**Katrina Pecot**



**Martina Barat**

**Why I applied:** My reason for joining the NCP program was mainly to get the knowledge, experience and competence to research the brain in an interdisciplinary team. What I find most interesting in NCP is the opportunity to get to know different technics, which help to answer a wide range of neuro-cognitive questions.

**Future goals:** In the future I would like to implement my knowledge and skills gained at NCP in clinical assessment of patients with neurologic or psychiatric impairments.

**Julia Groß**



**Why I applied:** I chose the NCP program because I wanted to change my educational focus from clinical linguistics to cognitive neuroscience. Furthermore I am interested in research methods and I would like to increase my research experience.

**Future goals:** After graduating from the NCP program I would like pursue a PhD and work on a research team. But I am not too sure about my future plans.



**Fernando Cross Villasana**

**Why I applied:** I've come to NCP mainly because of its integration of basic science and the applied field, since I want to do research that is relevant for the clinical context. The structure of the program is also highly appealing to me.

**Future goals:** I intend to follow into the Ph.D. level where I want to contribute to the continuous development of diagnostic and therapeutic resources with a scientific base. I am especially interested in ADHD.

## Alumni-Interview: Michael Zehetleitner

Michael Zehetleitner studied mathematics before studying NCP. He was one of the first NCP students (enrolment: 2004) and received his NCP Master Degree in 2006. Between 2006 and 2008 he was a Research Assistant in the CoTeSys Excellence Cluster. In 2008, and after his dissertation in 2007, he became Senior Research Assistant at the Chair of General and Experimental Psychology. His research interests lie in attention and short term plasticity in perception, executive control, and action.

Michael, you studied NCP at LMU Munich from 2004 to 2006. Then you did your PhD also at LMU Munich (Department of Psychology) and still work here. What were the reasons for this?

In my opinion the Chair of General and Experimental Psychology at the LMU Munich is an excellent place for education and research. There are several high class study programs (e.g. NCP, the Graduate School of Systemic Neuro Sciences) and the Chair is involved in international and interdisciplinary research projects and co-operations (e.g. CoTeSys Excellence Cluster). Further, the researchers affiliated with the Chair cover a wide range of psychological and neuroscientific topics. The methods used here expertly range from psychophysics

over electrophysiology, to modelling and functional imaging. These and other issues generate a very stimulating and fruitful research environment.

**What are your current tasks (duties) and projects?** My main tasks cover teaching and research. I usually teach research methods for undergraduate and graduate diploma students of psychology, as well as in NCP. Further I usually teach epistemological foundational problems of psychol-

*“...Research oriented, good preparation for PhD, broad without being shallow, fun....”*

ogy of perception and supervise various NCP research projects, Diploma or Master Theses and am involved in several PhD committees.

In terms of research I'm involved in the CoTeSys research cluster investigating and modelling short term plasticity in perception, cognition, and action. In this cluster, research spans from basic to applied research.

**If you should summarize NCP in four words, what would these words be?** Research oriented, good preparation for PhD, broad without being shallow, fun.

**How long did it take for you to understand the Department's room system?**

I still haven't. There seems to be some color coding of door frames for the different houses with different shades of violet...

**Which things do you still hold from your NCP study?** Quite a lot. Especially methods from the various lab rotations and some talks from the Wednesday colloquium.

**Which things do you miss from NCP?**

I'm so close that I don't have to miss anything.

**What are your future plans?**

I plan to continue research and teaching here at the Chair for the next years.

**If you would study again, which field would you choose?**

I would again start with mathematics, but choose physics instead of computer sciences as second subject. And then I'd continue as I did. Here in Munich.

**Are there any 'advices' that you would like to offer current NCP students?**

Stay curious.



# New collaborator: Paul Taylor

After his Bachelor in Physiological Sciences, Paul Taylor did his Masters Degree in Neurosciences at the University of Oxford. From 2002-2006 he worked on his PhD in Experimental psychology with Prof. Kia Nobre and Prof. Matthew Rushworth. He gained his research experience in the Brain and Behaviour Lab at School of Psychology in Birkbeck College as a Post Doctoral Research Assistant.



**Paul, you use TMS as a tool to study the human brain. What is TMS? Is TMS dangerous?**

TMS is short for 'transcranial magnetic stimulation', a tool used increasingly in cognitive neuroscience since its development in 1985. It uses a hand-held electromagnetic coil, placed over a participant's scalp, to briefly stimulate the region of cortex immediately underneath the coil. This is focal, non-invasive, transient – and safe: as with

all methods in psychology, neuroscience or physiology there are important guidelines on safe usage.

**What are the benefits of this relatively new research technique?**

TMS is used predominately to test hypotheses about the function of the stimulated area. For example, if a TMS pulse is applied to the part of primary motor cortex that controls the hand, then the participant's hand may twitch. If the visual cortex is stimulated, participants may see flashes called 'phosphenes'. The logic often employed by those using TMS is to ask participants to perform a psychological task thought to rely upon the candidate area, and test whether stimulating it affects task performance. Whereas the imaging methods can record what activity *correlates* with performance of a task, TMS can be used to find out what the *causal* role of the stimulated area is.

In addition, TMS can be used in combination with imaging methods in order to explore how parts of the brain communicate with each other. For example, TMS can be combined with brain-wave recording or brain-imaging in order to gain information on the neural dynamics underlying cognition.

**What are your plans and expectations for Munich?**

I am greatly looking forward to becoming a part of the exciting research community in Munich, and I hope to contribute by helping to establish a TMS facility.

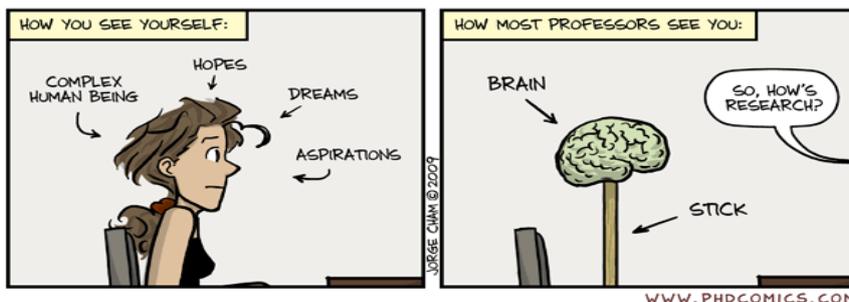
## In the News I

### NCP professorship

Since the winter semester 2008/09, the NCP professorship has been vacant, but the delivery and smooth running of the NCP program has been successfully managed by the interims professors Kathrin Finke (see *Brainstorm*, Issue Winter 2008) and Thomas Geyer, with the contribution of all NCP teaching staff. [Editors note: Because the funding of NCP program by the Elite Network Bavaria ends in September 2014, the Director of the NCP program, Hermann Müller, is currently seeking ways of funding a permanent NCP professorship, to ensure that this successful international Master Program will continue to be offered beyond September 2014.] This year, the professorship has been advertised (as a fixed-term position) and six out of approximately 50 candidates were invited for an interview, which included a presentation of their work and teaching concept. A decision of the selection committee is expected shortly; so hopefully, the new professor will take up the position in the near future. The Editors of the *Brainstorm* wish the members of the selection committee success with their decision.

### Notes of SSEC

In the (December) meeting of the student-staff-exchange committee (SSEC), the (first-semester) students rated NCP positively as a state-of-the-art course, which offers a range of student feedback and evaluation schemes – such as SSEC; more generally, "...everybody is pretty happy with the course...". However, the students also made some constructive suggestions for improvements, in particular, regarding the information policy, the timetabling of lectures and associated tutorials, and the availability of the lecture slides. The staff will act on and try to integrate these things into NCP in the nearer future.



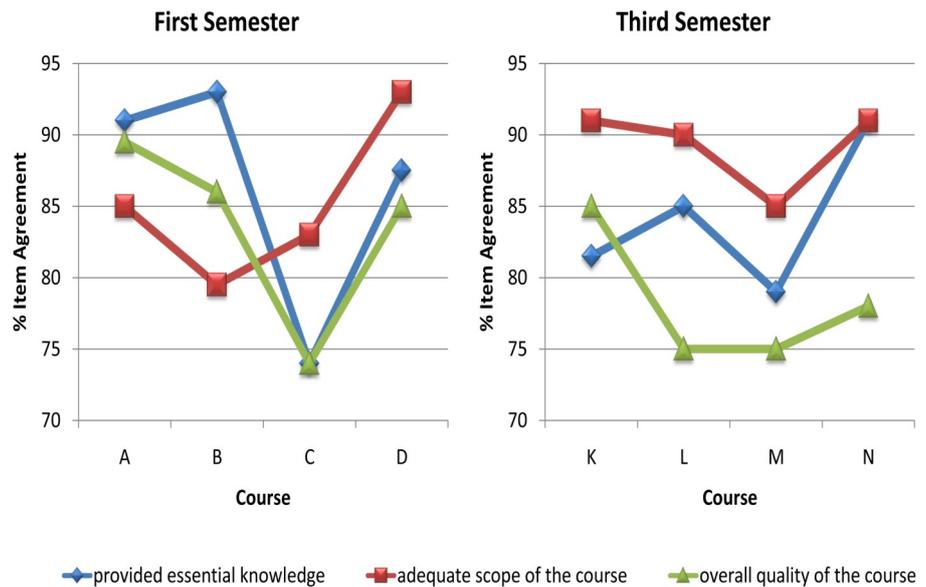
## In the News II

### NCP student evaluation

For the winter semester 2009/10, the first- and third-semester NCP students had the opportunity to provide feedback on their NCP courses and associated tutorials. Teaching quality was assessed by means of a standardized evaluation questionnaire; in addition, students could provide their lecturers with qualitative feedback in the form of free comments. In general, all NCP courses were evaluated very positively. The results for the three most important questionnaire items relating to the form of delivery and scope and impact of a given course are displayed on the right (results are shown in percent of item agreement). First semester courses: Course A (Basic Neuro-Cognitive Psychology); Course B (Basic Neurosciences 1); Course C (Classical Psychological Methods 1); and Course D (Neuro-cognitive Methods 1); Third Semester Courses: Course K (Basic Neuro-Cognitive Research); Course L (Clinical Neuro-Cognitive Research); Course M (Applied Neuro-Cognitive Research); and Course N (Neuro-Cognitive Methods 3).

### NCP Coordinator graduates

Dr. Petra Redel has graduated with a Ph.D. thesis on "Visual attentional assessment in Mild Cognitive Impairment and Alzheimer's disease" (with "summa cum laude"). Her Ph.D. defense took place just before Christmas 2009. We wish Dr. Redel a highly successful career in Neuro-cognitive Psychology and are very happy that she will continue with the NCP coordination!



## New collaborator: Iris Wiegand

**With the beginning of the winter semester 2009-2010, Iris Wiegand took over a NCP position, previously occupied by Ellen Matthias—who currently undergoes a research internship at LMU Munich.**



**Iris Wiegand.** Until October 2004, I studied Psychology at the Saarland University in Saarbrücken (Germany). During this time, I got involved in experimental neurocognitive research, being a student research assistant in the cognitive psychology, clinical neuropsychology and experimental neuropsychology. This offered me the opportunity to be a part of a couple of research projects, e.g. working memory processes, implicit memory processing in neglect, and lastly cross cultural differences in recognition memory for associations. In doing so, I learned to work with EEG and I was introduced in fMRI methods. Due to my special interests concerning the brain mechanisms underlying human cognitions, in 2007 I completed an internship at

the Max-Planck institute of Cognition and Brain Sciences in Leipzig, where I contributed to experiments of language processing. To get a deeper insight into clinical work with brain damaged patients, I worked as an intern in the Neurological Clinic Bad Aibling (2008/2009). In this context, I conducted a study to specify adequate measurement values concerning neurofeedback in patients suffering from attentional disorders due to stroke or CCI.

In my Diploma Thesis, supervised by Prof. Dr. A. Mecklinger, I conducted an EEG-Experiment investigating contributions of familiarity to associative memory with respect to unitization processes.

Besides working at a teaching assistant in NCP next year, I am going to begin my PhD studies at the Neuro-cognitive Psychology Unit Department Psychologie LMU München. Concerning my dissertation, my aim is to investigate the development of attentional processes in the aging brain using brain imaging methods, particularly event related potentials.

I am looking forward to the new city, new people and challenges in my life and to team up with my PhD advisor Kathrin Finke and the staff members of her research group!

## CHE evaluated LMU's Psychology Department masterly

In 2009, the CHE – Centre for Higher Education Development – continued with its “Excellence Ranking” (which had started in 2007 for Biology, Chemistry, Physics and Mathematics) for the disciplines of Political Science, Economics, and Psychology. In this evaluation, the CHE attempts to compare the research strengths and internationality of European Universities based on six indicators: publications and citations as well as “highly cited books” (as research indicators), student mobility, teaching staff mobility, and offering an Erasmus Mundus

Master’s course (as indicators of an international orientation of the department). For Germany, and as you can see below, the Psychology Department of LMU Munich was the only Department that was awarded six stars: number of publications, number of citations, teaching staff mobility, internationality of staff, master, and doctoral students. Each star indicates outstanding performance in the respective criterion. Further information: <http://www.excellenceranking.org>.

\* =top placement in this indicator

### PSYCHOLOGY

University	Overall studysituation [?]	International doctorates [?]	International master's students [?]	International staff [?]	Preselection: Highly cited books [?]	Preselection: Erasmus Mundus Master's [?]	Preselection: Teaching staff mobility [?]	Preselection: Student mobility [?]	Preselection: Citations [?]	Preselection: Publications [?]
U Aberdeen	*	*								
U Aix-Marseille 1		*	*							
U Amsterdam	*	*	*	*						*
VU Amsterdam	*	*	*		*		*	*	*	*
U Bangor	*	*	*	*	*	*	*	*	*	*
U Barcelona	*	*	*	*	*	*	*	*	*	*
U Bath		*	*	*						
HU Berlin	*	*	*	*	*	*	*	*	*	*
U Birmingham	*	*	*	*	*	*	*	*	*	*
U Bologna		*	*	*	*	*	*	*	*	*
U Bristol	*	*	*	*	*	*	*	*	*	*
U Cambridge	*	*	*	*	*	*	*	*	*	*
U Cardiff	*	*	*	*	*	*	*	*	*	*
U Coimbra		*	*	*	*	*	*	*	*	*
U Edinburgh	*	*	*	*	*	*	*	*	*	*
U Essex		*	*	*	*	*	*	*	*	*
U Freiburg	*	*	*	*	*	*	*	*	*	*
U Gent	*	*	*	*	*	*	*	*	*	*
U Glasgow	*	*	*	*	*	*	*	*	*	*
U Göteborg	*	*	*	*	*	*	*	*	*	*
U Groningen	*	*	*	*	*	*	*	*	*	*
U Heidelberg	*	*	*	*	*	*	*	*	*	*
U Helsinki	*	*	*	*	*	*	*	*	*	*
U Jena	*	*	*	*	*	*	*	*	*	*
U Konstanz		*	*	*	*	*	*	*	*	*
U Leeds	*	*	*	*	*	*	*	*	*	*
U Leiden	*	*	*	*	*	*	*	*	*	*
U Leipzig	*	*	*	*	*	*	*	*	*	*
KU Leuven	*	*	*	*	*	*	*	*	*	*
U Liverpool	*	*	*	*	*	*	*	*	*	*

### PSYCHOLOGY

University	Overall studysituation [?]	International doctorates [?]	International master's students [?]	International staff [?]	Preselection: Highly cited books [?]	Preselection: Erasmus Mundus Master's [?]	Preselection: Teaching staff mobility [?]	Preselection: Student mobility [?]	Preselection: Citations [?]	Preselection: Publications [?]
KC London	*	*	*	*	*	*	*	*	*	*
U London UC	*	*	*	*	*	*	*	*	*	*
UC Louvain	*	*	*	*	*	*	*	*	*	*
UL Lyon 2		*	*	*	*	*	*	*	*	*
U Maastricht	*	*	*	*	*	*	*	*	*	*
U Manchester	*	*	*	*	*	*	*	*	*	*
U Marburg	*	*	*	*	*	*	*	*	*	*
LMU München	*	*	*	*	*	*	*	*	*	*
U Nijmegen	*	*	*	*	*	*	*	*	*	*
U Örebro	*	*	*	*	*	*	*	*	*	*
U Oxford	*	*	*	*	*	*	*	*	*	*
U Padova	*	*	*	*	*	*	*	*	*	*
U Paris 5	*	*	*	*	*	*	*	*	*	*
U Roma Sapienza	*	*	*	*	*	*	*	*	*	*
U Rotterdam	*	*	*	*	*	*	*	*	*	*
U Sheffield	*	*	*	*	*	*	*	*	*	*
U Southampton	*	*	*	*	*	*	*	*	*	*
Karolinska Institutet, Stockholm	*	*	*	*	*	*	*	*	*	*
U Sunderland	*	*	*	*	*	*	*	*	*	*
U Sussex	*	*	*	*	*	*	*	*	*	*
U Tilburg	*	*	*	*	*	*	*	*	*	*
U Trier	*	*	*	*	*	*	*	*	*	*
U Uppsala	*	*	*	*	*	*	*	*	*	*
U Utrecht	*	*	*	*	*	*	*	*	*	*
U Valencia	*	*	*	*	*	*	*	*	*	*
U Warwick	*	*	*	*	*	*	*	*	*	*
U Würzburg	*	*	*	*	*	*	*	*	*	*
U York	*	*	*	*	*	*	*	*	*	*
U Zürich	*	*	*	*	*	*	*	*	*	*

# NCP-students in Berlin

Science is not only about investigation, but also about exchange. For that reason many NCP students of the second year chose to visit different laboratories in Berlin between 4th and 7th of June last Semester. With the help of coordi-

nator Professor Kathrin Finke it was possible to visit several research institutions at the Clinic Charité, the Max-Plank-Institute for Human Development and the Bernstein-Centre for Computational Neuroscience.

## NCP TRIP TO BERLIN



Max Planck Institute for Human Development



CHARITÉ  
UNIVERSITÄTSMEDIZIN BERLIN



BERNSTEIN CENTER FOR COMPUTATIONAL NEUROSCIENCE BERLIN



Researchers from the MPI introduced their innovative post-graduate study of life-sciences and their Baby lab. Dr. Antje Kraft showed us around the Charité where we could see laboratories using Transcranial Magnetic Stimulation, Near

Infrared Spectroscopy and even electrical stimulation of damaged nerve cells to guide their regrowth. The students of the NCP thank all the staff for their dedication in helping to organize this trip!

# NCP Student Poster Presentation Winners

(Posters are based on the second research project of the fifth cohort of NCP students)

## 1st

## Sven Hilbert

We examined motor sequence learning which refers to the acquisition of stereotyped movement elements as a unitary sequence through repeated practice. He investigated the motor memory reconsolidation mechanisms in humans and, for the first time, assessed its neural correlates by functional magnetic resonance imaging (fMRI) in order to shed light on the resulting plastic changes in the human brain. The behavioral results suggest that a reactivated memory trace is indeed vulnerable to interference. In addition, the neural mechanisms of reconsolidation seem to resemble the ones observed during consolidation, namely a reorganization of corticostriatal and cortico-cerebellar networks.

## Motor Memory Reconsolidation and its neural Basis

Sven Hilbert  
Supervisors: Prof. Dr. Adrian Danek, Prof. Dr. Julien Doyon

**Introduction**

Motor sequence learning is a relatively effortless process, describing the composition of simple, stereotyped movements into a unitary well-rehearsed sequence through practice. After practice, the motor memory trace undergoes off-line consolidation processes, strengthening the initially labile trace. While consolidation was traditionally thought to be a unitary process with a fixed beginning and end, yet various studies (e.g., Pyltschovsky & Sara, 1997; Nader et al., 2000) have found conclusive evidence that a consolidated memory trace can be brought back into a labile state by reactivating it, making it sensitive to disruption. The current study used interference with an already consolidated motor sequence to clarify reconsolidation mechanisms in humans on the behavioral level and, for the first time, shed light on its neural substrates.

**Procedure**

Motor sequence learning was trained using an adapted version of the sequential finger tapping task by Karni et al. (1993, 1998). Subjects were asked to produce an explicitly known sequence of 8 finger movements, using a response box that enabled subjects to execute a scanner. Another, yet similarly constructed, 10-element finger sequence was employed in a counter-balanced manner for the interference condition.

**Design**

The subjects were divided into two groups, Group 1 (n = 5) and Group 2 (n = 6). Both groups had a practice session for the first finger tapping sequence (Sequence A) of 24 blocks on day 1 (Training) and a first retest

**Results**

**Behavioral**  
No gains between Training and Retest 2 were observed (t(12)=1.512, p=.157). Between Retest 1 and Retest 2, the interaction Group x Blocks failed to reach significance (F(1)=2.40, p=.13). Yet, keeping in mind the small sample size, the tendency revealed can be seen as a strong indication.

**fMRI**  
Decrease in activation in Subject 1 between Retest 1 and Retest 2. A significant decrease was found in the putamen and cortical motor areas. Increase in activation in Subject 2 between Training and Retest 2. Significant increase was found in the putamen and cortical motor areas, mirroring the pattern of decrease in Subject 1.

**Conclusion**

The results strongly point towards susceptibility of a motor memory trace to interference, thus the two processes seem to be qualitatively the same, even though they might differ regarding quantitative effects. Future studies should control for interference in the control group + a possible reason for the non-significant interaction.

## The Ventral Nucleus of the Lateral Lemniscus (VNLL) and its potential role in temporal processing

Garrett Moss<sup>1</sup>, Klug, Achim<sup>1</sup>, Grothe, Benedikt<sup>1</sup>  
<sup>1</sup>Ludwig-Maximilians-University, Munich

## 2nd

## Mona Gavert

The VNLL is assumed to play a role in temporal processing of auditory information. In an *in vivo* study in bats Covey and Casadevall (1991) reported that spike latency in VNLL cells was independent of sound pressure and frequency and thereby undermined its importance for encoding stimulus onset. In this study we characterized the basic electrophysiological and morphological properties of neurons within the nucleus and analyzed its suitability for performing temporal processing.

**Background**

The VNLL is assumed to play a role in temporal processing of auditory information. In an *in vivo* study in bats Covey and Casadevall (1991) reported that spike latency in VNLL cells was independent of sound pressure and frequency and thereby undermined its importance for encoding stimulus onset. In this study we characterized the basic electrophysiological and morphological properties of neurons within the nucleus and analyzed its suitability for performing temporal processing.

**Results**

Type I – sustained firing pattern

Type II – transient firing pattern

**Methods**

The auditory brainstem of 14 Monodelphis domestica aged 12 to 19 days were included in the experiment. Whole-cell voltage-clamp and current-clamp recordings of 41 neurons located within the VNLL were performed at 33°C. The recording electrodes contained fluorescent dyes to ensure labeling of the recorded cells. After recordings, brain slices were analyzed with a Zeiss 510 NLO two-photon microscope.

**Discussion**

Type I cells responded to an injection of negative current with sustained firing, while type II cells responded with transient firing. This is consistent with previous findings (Wu, 1996). High variability in action potential amplitude and membrane capacitance suggest the existence of different subtypes of type I cells. These may be involved in encoding different ongoing sensory properties of an auditory stimulus or in selecting synchronous firing amongst naive cells. Type II cells may encode stimulus onset independent of current strength. Action potentials were precisely locked to stimulus onset for current strengths higher than 0.2 nA. Assuming that different sound pressures can be imitated by different current strengths, our observations underline that the findings reported by Covey and Casadevall (1991) are due to properties of VNLL cells themselves rather than upstream modulation of the stimulus.

The ventral nucleus of the lateral lemniscus is one of the nuclei in the auditory brainstem whose role in auditory processing is only poorly understood. Previous studies suggest a role of the VNLL in temporal aspects of auditory information. To provide a framework for investigating this possibility, we characterized the basic electrophysiological and morphological properties of neurons within this nucleus and analyzed its suitability for accomplishing this potential role.

## Problem-Solving in Great Apes: On Cognitive Flexibility & Insight

Supervisors: Dr. Josef Gall & Dr. Jan Zwickel  
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**Introduction**

Insight: Sudden production of a new, adaptive response / reorganization of experience not arrived at by trial behavior (Thorpe 1956)

Insight problems: Impasses rely on interaction between the problem and prior knowledge

Einstellung effect: Habitual solving strategy blocks search for an alternative solution (Luchins & Luchins, 1959)

Measures of insight:

- Spontaneous problem-solving after experienced function of relevant parts of a problem
- Characteristic learning curve: maximal performance already after the 1<sup>st</sup> successful trial

Insightful problem-solving in great apes

- Spontaneous problem-solving after a period of pure observation (Köhler, 1925)
- Understanding: the return of problems & identification of possible solutions (Premack & Woodruff, 1978)

Research questions:

Great apes: insight into requirements of a non-trivial apparatus-problem?

Einstellung effect present in great apes?

**Results**

Learning curve

1. Analyzed solution-times: T0. No significant difference between 2<sup>nd</sup> and 10<sup>th</sup> trial (Wilcoxon test: z = .01, p > .5, N = 5)

Figure 3: Mean values for solution times of App. A (5C) across trials (only apes that used the handle).

Einstellung effect

1. Apes with finger-picking experience longer to detect that handle is movable (Mann-Whitney test: z = 1.93, p = .05, N = 13)

1. Alternative explanation: predisposition for handle use in some apes

Figure 4: Effect of finger-picking experience on the time to detect that the handle is movable (T0).

Performance in most difficult condition (App. C)

4 (of 5) chimpanzees, 2 (of 5) bonobos and 1 (of 7) orangutans solved App. C

1. One chimpanzee solved task directly in the first attempt

1. Frequency of efficient actions higher in successful apes (Mann-Whitney test: z = -2.88, p < .01, N = 16)

**Conclusions**

Evidence for insightful problem-solving in all 3 species of great apes

Cases of spontaneous, fast problem-solving without any fumbling cannot be explained by trial-and-error learning

Maximal performance already reached in 2<sup>nd</sup> trial

Findings suggest insight into requirements of the task

Evidence for presence of an Einstellung effect

Prior experience with a solving-strategy (finger-picking) delays discovery of a new strategy (handle-use)

Cognitive flexibility reduced as consequence of prior knowledge

**References**

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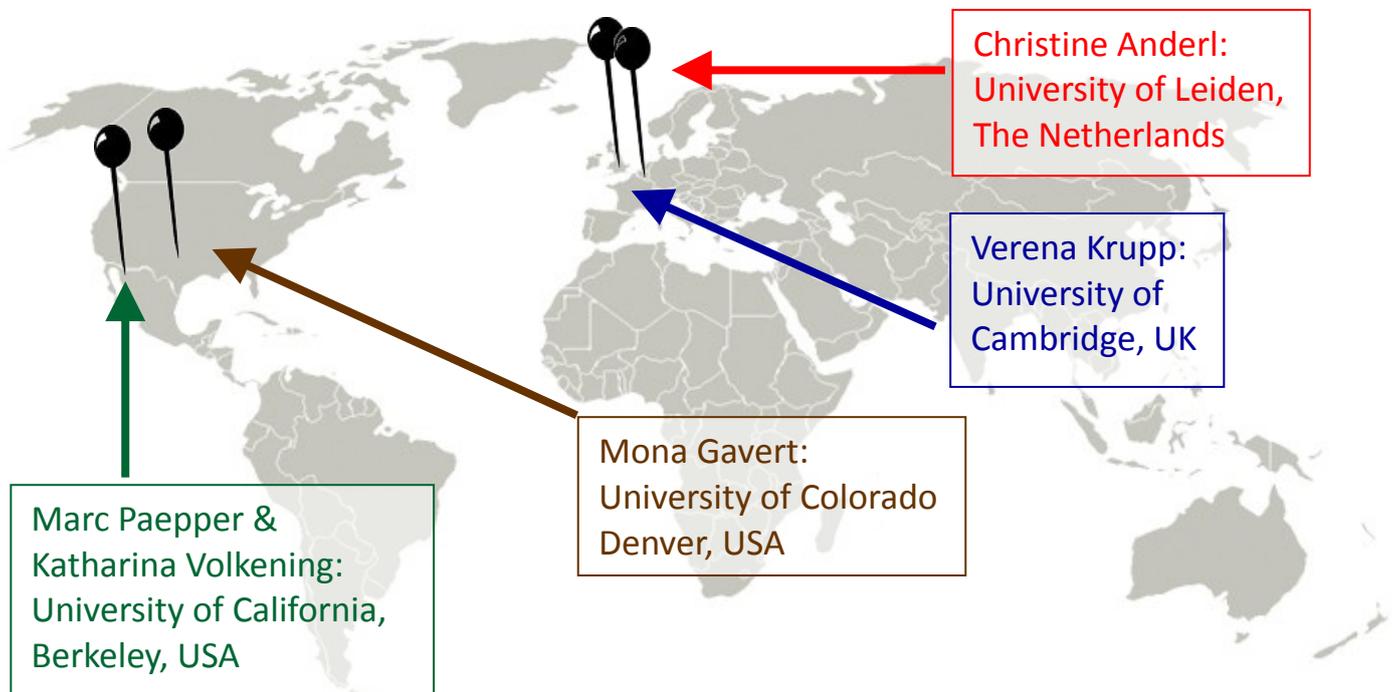
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## 2nd

## Christoph Völter

We studied the abilities of apes in problem solving and whether they were able to show insight into the requirements of a task. We found evidence for insightful solving of an apparatus-problem by three species of great apes: Several apes succeeded in their first operation on the apparatus. Additionally, the apes reached their maximal performance already in their second successful trial. These results can hardly be explained by the alternative possibility, trial-and-error learning. He also found that prior knowledge reduces cognitive flexibility. Previous experience with one solving strategy delayed the discovery of a new, alternative strategy significantly a phenomenon known as Einstellung effect.

## NCP students abroad



Marc Paepper &  
Katharina Volkening:  
University of California,  
Berkeley, USA

Mona Gavert:  
University of Colorado  
Denver, USA

Christine Anderl:  
University of Leiden,  
The Netherlands

Verena Krupp:  
University of  
Cambridge, UK

## RESEARCH PROJECTS OF FIFTH COHORT

### Sean Sun

#### Department of Psychiatry, LMU

Did several factor analyses of the measures of 5 subtests from Test for Attentional Performance (TAP) and other attentional tests with a large sample of test results of psychiatric patients under the supervision of Prof. Hennig- Fast and Prof. Engel . He showed a separation in the attention measurements between reaction time and the others, e.g. omissions and errors. He concluded that according to the nature of the attentional tests, latent factors underlying various measures were displayed across different attention components.

### Nicola Schweitzer

#### Department of Psychology, LMU

In her second project, she combined navigated transcranial magnetic stimulation (nTMS) with electroencephalography (EEG) in order to ana-

lyse the distinct influence of the angular gyrus (GA) and the frontal eye field (FEF) on the P300 component in a visual oddball paradigm under the supervision of Dr. Antje Kraft and Prof. Kathrin Finke. The combination of navigated TMS and event-related potentials has enabled the investigation of GA and FEF involvement in target detection. TMS has both, facilitating and inhibitory effects on behavioural and EEG data, depending on the location and time of stimulation.

### Tristan Nakagawa

#### Department of Psychology, LMU

Examined gaze direction in pinch grasp preparation. Based on the thumb providing most information for hand to target transport, the current study was conducted to investigate whether in early grasp preparation attraction of gaze by thumb contact area on the object could also be found. Results

suggest an interactive pattern of gaze attraction by thumb application point for circular but not for square two dimensional shapes. The interaction pattern is interpreted as an effect of grasp application area size.

### Jared Pool

#### Klinikum Rechts der Isar, Neurokognitiv Zentrum, Munich

He investigated basic pathological correlative connectivity in the resting state networks of acute suffering schizophrenic patients. Baseline differences in the resting state networks of patients with schizophrenia (in comparison with health controls) including regressions (e.g. PANSS scores) and factor analyses (e.g. sex) were performed. Numerous robust results ranging from executive control associated networks to primary sensory networks were obtained.

## RESEARCH PROJECTS OF FIFTH COHORT

**Marc Paepper**

**Cognition and Action Lab, University of California, Berkeley, USA**

He studied on modelling semantic networks. The cerebral hemispheres are physically very symmetric, but many scientific studies have established profound asymmetries. The Double Filtering by Frequency theory by Ivry and Robertson suggests that asymmetries arise by differences in filtering frequencies. While the left hemisphere processes relatively more high frequencies, the right hemisphere processes relatively more low frequencies. There is much evidence for this from visual, auditory and language related studies. The idea of our research is to extend this approach to semantics. We model semantic networks (one network for each hemisphere) and let them differ only in their dynamics and not in their semantics. We are testing whether this approach can lead to the asymmetries observed in a semantic cueing paradigm of Beeman. We find that such a model can yield some of the behavioral data, but is not sufficient to achieve the full extent of the data.

**Anselm Doll**

**Department of Psychology, LMU**

Individuals with Asperger's syndrome typically have difficulties with tests of Theory of Mind but function otherwise normally. In this experiment, cartoons of three different types of logical mechanisms were shown to people with the Asperger's Syndrome and controls while using functional magnetic resonance imaging (fMRI) to observe their brain activation. Aims were to elucidate the brain activation of people with Asperger's syndrome during humor processing and compare this to people with normal theory of mind abilities.

**Verena Krupp**

**Department of Psychiatry, Addenbrookes Hospital, University of Cambridge, UK**

In recent years the amount of adults claiming to have Attention-deficit/hyperactivity disorder (ADHD) increased dramatically, raising the suspicion that

some of them may malingering symptoms for secondary gain. Therefore, valid diagnostic tools in the assessment of ADHD are of great interest. In the first project, we provided healthy adults with information about ADHD and instructed them to feign symptoms on questionnaires that are usual for the assessment of subjective symptoms, as well as on the whole report of TVA, which provides an objective measure of the affected and preserved attentional functions of ADHD adults. Second project was an expansion of the first project that took place in UK.

**Katharina Volkening**

**Neurology Clinic, Bad Aibling, Germany**

Previous studies have demonstrated the involvement of spatial codes in the representation of time and numbers. Patients with right parietal damage often exhibit lateralized deficits in spatial attention. This is typically associated with a distortion in numerical and temporal processing. In order to evaluate whether optokinetic stimulation (modulation of space) could influence or even alleviate neglect patients' deficits in physical space, mental number and mental time representation, right-brain damaged patients with and without neglect and a healthy control group performed related tasks after leftward, rightward or static optokinetic stimulation. The tasks included line bisection, number interval bisection, and time estimation and bisection.

**Ahu Gökçe**

**Department of Psychology, LMU**

The aim of the project was to look if any eye movements occur during a priming of pop-out search task and to look at the reflections of oculomotor variables, namely the saccade numbers, saccade latencies and first saccade locations, during the compound visual search task.

**Tiina Salminen**

**Department of Psychology, LMU**

Knowing and evaluating moral acts and decisions count for getting along social environments as well as the ability to behave in a socially appropriate way.

The neural basis for both moral behavior and moral cognition has been extensively studied although a consensus is still lacking. An interesting means to study the questions of moral psychology is offered by different patient groups who show impairments in either moral behavior or in evaluating morally questionable acts. Asperger's syndrome leads to impairment in social cognition. As social awareness constitutes a large portion in morality as well, it would be expected that individuals with Asperger's syndrome show also deficits in moral cognition. This study was conducted in order to examine moral decision-making and its underlying neural processes in people with Asperger's syndrome.

**Christine Anderl**

**University of Leiden, Netherlands**

The present study was designed to investigate motivational influences on the movement-induced bias on visual selection in a pop-out search task. Performance in the perceptual task was hypothesized to be improved when participants prepared for a movement for which the target-defining feature dimension was relevant compared to when they prepared for an incongruent movement. This effect was expected to be modulated by motivation, resulting in a more pronounced effect accompanying higher motivation between and within participants, reflected by an increased tonic pupil dilation.



**For Sven Hilbert, Christoph Völter and Mona Gavert, please see Poster presentation winners on Page 10**

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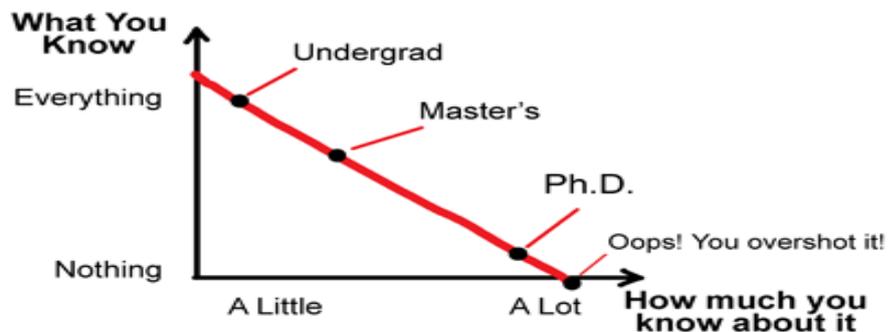
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The 'M.Sc. in Neuro-cognitive Psychology (NCP)' was established in 2004 by the *Elite Network Bavaria*. The aim of the four-semester program is to educate a select group of students per annum (recruited world-wide) in Neuro-cognitive Psychology, an emerging field at the intersection of *Psychology* and the *Cognitive Neurosciences*. The course focuses on the fundamental concepts and methods of this field (psychophysics, EEG, fMRI, patient studies) as well as their application in selected fields, such as 'Neuro-cognitive Ergonomics'. Students undertake two years of course work in small groups, comprising lectures, methodology, and independent research projects. Most graduates of the initial cohorts successfully applied for prestigious international PhD programs such as the '*Graduate School for Systemic Neurosciences*'.

## What You Know vs How much you know about it



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## Graduation Ceremony 2009

In Fall 2009 the Elite Network Bavaria (ENB) hold a Celebration Ceremony, offering 230 students from the various elite study programs (including NCP) with their ENB (Master) Graduation Certificates. The Editors of *the Brainstorm* wish the NCP Graduates all the best for their future career.

