The NPL is one of the laboratory resources of the Center for Research in Psychology (CIPsi) from the School of Psychology, University of Minho. The main objective of the NPL is the development of research in the area of human clinical neurosciences.

The Lab resources include a variety of technological equipment for registration and analysis of a variety of nervous system measures such as: autonomic variables (polygraph and biofeedback); EEG/ERP; TMS/tDCS; MRI.

The NPL opened in 2007 and since then it has gathered a multidisciplinary team with high level of training and expertise to contribute to the expanding clinical services and research programs of our school.

Following past and current Lab involvement in undergraduate and graduate teaching of psychology students, it is time to venture out in spreading the contributions of neurosciences to the academia by offering an introductory course in “Brain and Behavior” as an elective course open to students of all disciplines.

This Spring Semester we will start offering to a diverse group of students (including majors in Linguistics, Anthropology, Biology, Biochemistry, Engineers, Philosophy, Mathematics, etc.) an opportunity to come in direct contact with recent research illustrating how brain research contributes to the complexities of human behavior in diverse domains. The brain basis of perception, language, emotion, motor behavior, learning, decision making, personality, culture, neuroplasticity, vision, and moral judgment will be provided and discussed in terms of applications to aesthetics, linguistics, psychiatry, engineering, education, economy, politics, anthropology, rehabilitation and ethics.

I believe this course will be a great opportunity to make students aware of the relevant current research in brain and behavior with a wide variety of topics including those that are addressed by students’ elective majors.

The challenge of meeting the needs of such a wide array of students is immense, but I believe that the lab will be enriched by making the outcomes of our daily research efforts available to the student community school-wide.

Óscar Gonçalves, PhD
NPL Lab Director

“Brain and Behavior”
Course Made Available to Students of All Disciplines

NPL Newsletter – February, 2013
NeuroPsychoPhysiology Lab
The cognitive stimulation web-based platform **NEP-UM** is well on its way to becoming a widely used rehabilitation **web-tool**.

It was recently announced in local and national news with the main investigator Adriana Sampaio presenting details of the successful ongoing project.

Please see the Platform announcements below:


http://www.dinheirovivo.pt/Buzz/Artigo/CIECO094608.html


http://aulp.org/noticias/revista-de-imprensa/ensino-superior/5376-plataforma-previne-doencas-neurocognitivas

http://m.jn.pt/m/newsArticle?contentId=3011191

http://inclusaoaquilino.blogspot.pt/2013_01_01_archive.html
The European Master (double degree between the Portugal -University of Minho and France -Lille University) in psychology and neurocognitive processes and affective sciences program (PI's Óscar Gonçalves & Yann Coello) was awarded a research and education grant for the next three years by both the Council of Rectors of Portuguese Universities (CRUP) and the Confederation of Presidents of French Universities (CPU). The grant will fund the exchange of Faculty and students within the program as well as research under the supervision of faculty from both institutions.

---

SOCIETY OF BIOLOGICAL PSYCHIATRY

February 5, 2013

Ana Pinheiro, PhD
School of Psychology, University of Minho
Braga, Portugal

Dear Dr. Pinheiro:

It gives me great pleasure to inform you that you have been named a recipient of the Society of Biological Psychiatry’s 2013 International Travel Fellowship Award to attend our 2013 annual meeting, May 16-18, 2013 in San Francisco, California. The Travel Fellowships are made possible by the Society of Biological Psychiatry and we are pleased to offer this award of $1,500 to help defray some of your costs of attending the Society’s meeting. We have many activities planned for you at the meeting.
Members

Teresa Velasquez in Universidade de Santiago de Compostela.

Ana Pinheiro is in Harvard Medical School continuing her work on higher-order processes, such as language comprehension and speech perception, in healthy populations and in clinical disorders, particularly schizophrenia-spectrum disorders.
Sensory-based and higher-order operations contribute to abnormal emotional prosody processing in schizophrenia: an electrophysiological investigation.

While visiting NPL, Professor Fernando Diaz, from University of Santiago de Compostela, gave a presentation on Neurocognitive markers of normal aging, mild cognitive impairment and Alzheimer’s disease.

Having lunch with Prof. Fernando Díaz...
Processing Deficits in Multiple Sclerosis

My presentation aims to give a brief overview about the principal results obtained on my PhD project about visual processing speed deficits in Multiple Sclerosis (MS). MS is a demyelinating disease of the central nervous system, affecting mostly adults between 20 and 50 years olds. Although, cognitive deficits, such as processing speed and visual problems are common, both at initial stages and during disease course, the interactions between both are not fully understood. Our results give further insights about the potential contribution of visual system on the understanding the visual processing speed deficits.

Follow her work at:
http://webs.psi.uminho.pt/LABSPSI/lnp/people/silvana.html
Second International Porto Congress on Multiple Sclerosis

Luciana Gomes and Rosana Magalhães presented their work as posters in the second International Porto Congress of Multiple Sclerosis.


- Validation of Portuguese version of the modified fatigue impact scale and the fatigue severity scale for individuals with Multiple Sclerosis Luciana Reis Gomes, Filipe Palavra, José Maurício Haas Bueno, Rosana Magalhães, José Grilo Gonçalves, João Cerqueira, Óscar F. Gonçalves.
Title: "Can we enhance couples´empathic capacity using neurofeedback training?"

Team: Joana Coutinho, Cléudna Patricia de Oliveira Silva, Jean Decety, Kristin Perrone McGovern, Óscar F Gonçalves & Vânia Sousa Lima

ABSTRACT: Empathy is a psychological construct broadly studied in psychology. Recently, neurosciences have been contributing for explaining empathic processes in what refers to their neurobiological correlates, both at peripheral and central nervous system level. However, not so much research has been conducted in what concerns the efficacy of interventions directed to empathy promotion. One of the main interpersonal contexts where empathy promotion appears to be critical is in couples’ relationship. The main goal of this project is to analyze the effect of interventions focused on brain processes involved in empathy, in the improvement of couples’ members ability to respond to each other more empathically. We will use neurofeedback to promote couple’s empathic ability. In neurofeedback training, the participant receives real time information about his/her neuronal activation pattern while he/she is inside the functional magnetic ressonance scanner (fMRI). Although real time fMRI neurofeedback is very recent, studies have found promising results in several areas, such as: self-regulation of the activity of brain structures relevant to emotional processing (6), to linguistic processing (7), and also in brain areas involved in pain perception, which aims to reduce chronic pain (8). We hypothesize that intervening directly on the neuronal activation pattern of areas that have been associated to empathic processes, through a neuro modulation intervention such as neurofeedback, we will have efficacious results in improving the empathic responses. Our sample will be composed by 10 couples previously assessed to present high levels of conflict or dissatisfaction through the Dyadic Adjustment Scale. 5 couples (10 participants) will constitute the experimental group and 5 (10 participants) will constitute the control group. The later will receive the same intervention of the experimental group but with sham neurofeedback information. For the empathy task that we will use both in the pre and post-training assessment, members of the couple have to respond in an empathic way to a video of their respective spouse expressing an emotional need. This video will be selected from a structured interaction task between both elements of the couple, previously performed in the lab.
1) Your impressions of Portugal

Portugal seems like a country full of fun loving people. They are all so nice to me when I need their help even though I cannot speak Portuguese. In addition, I feel like I am living in my country because some Portuguese personalities or characters are quite similar to Thai. For the language, I think it is really difficult at first, but I feel getting used to it after I had a chance to study one Portuguese course and I think it is one of the most interesting languages. I want to learn more if I have an opportunity.

2) Your impressions of University of Minho

I was very fascinated with University of Minho because it is located up on a hill. So I can touch the atmosphere of nature. Despite being a young university it has a lot of interesting programs and projects to offer to students and has a strong academic potential.

3) Your impressions of our lab

I like the lab. It is growing and becoming more and more international. Lab Director and his colleagues are all pleasant and friendly. I am very happy to be here being part of the Lab even though it is just for few months. It is a great opportunity for me to learn, study and explore new things.
1) Alzheimer's disease
Alzheimer’s disease (AD) is a biological process leading to cerebral deterioration. The main pathophysiological findings in this disease are: amyloid-beta plaques and neurofibrillary tangles. From a neuropsychological perspective, this process leads to a progressive and inevitably loss of cognitive functioning. Although people usually associate memory loss with Alzheimer’s disease this is only one of the many evident profiles (some display visuospatial impairments early in the disease).

2) How is it diagnosed?
The diagnosis of any specific type of dementia is a complex differential clinical diagnostic process with neurologists, neuropsychologists, psychiatrists and geriatricians playing an important roles in the process. Neuroimaging allows an assessment of structural (CT scan, sMRI) and functional (fMRI, ASL, FDG-PET, SPECT) alterations and sometimes of the underlying pathologies (PiB-PET). Blood and genetic analysis allow searching for specific causes of cognitive impairment and ruling out of other (sometimes treatable) causes. Despite the great efficiency of these imaging techniques and CSF biomarkers, neuropsychological assessment still plays a key role in the diagnoses since it allows the characterization of the pattern of the cognitive impairment.

Despite advances in diagnosis there is still a lot of stigma and myth associated with having a dementia diagnosis for the person with dementia and their families. This stigma, along with the inherent challenges/technical difficulties of providing an (accurate) early diagnosis, further impedes early diagnosis, a phase in which people can make informed and planned decisions about their own future.

Therefore public awareness should be a priority for practitioners, researchers, family and patient associations, in promoting high quality-informed media communications.

3) What are some available treatments?
In face of the complexity of dementia an effective disease-modifying drug has not been yet developed. Current available pharmacological therapies provide modest efficacy for cognitive and behavioral symptoms. In this context, several non-pharmacological therapies (such as cognitive stimulation, music therapy, etc.), have been developed with an aim of promoting cognition and functionality. Although empirical practice points to beneficial effects there is still limited (few studies) evidence pointing at the efficiency of many of these interventions.
Association football, more frequently known as soccer (USA) or football (Europe) is the world’s most popular ball game. It involves not only a great number of football players (children, adolescent and adults) but also spectators, since this sport can be played almost anywhere. In this ball game, the field players are allowed to use their feet, legs, torso or head to kick the ball (the goalkeeper is the only player allowed to touch the ball with the hands or arms). Therefore, the unprotected head is frequently the primary contact point with the ball by the players and can be kicked to travel over 100 km/hour. Additionally, this contact can also be found in player-to-player, player-to-ground and player-to-goalpost conditions.

Although a contact sport, there has not been much research on the negative effects of heading the ball and soccer-related brain injuries. Using high-resolution diffusion tensor imaging (DTI), a group of researchers from Brigham and Women’s Hospital (BWH) in Boston, MA and Ludwig-Maximilians-University in Munich, Germany studied white matter integrity in a group of 12 elite soccer players with no previous history of symptomatic concussion in comparison with a group of 8 swimmers (a group with low exposure to repetitive brain trauma). Using this high-resolution neuroimaging technique that allows the visualization and measurement of the white matter tracts in the living brain, they were able to assess alterations in the white matter architecture through fractional anisotropy (FA), axial diffusivity and radial diffusivity – parameters that are associated with fiber coherence, axonal and myelin pathology. Results from this study showed increased radial diffusivity (a measure of myelin integrity) in soccer players in the frontal lobe (right orbitofrontal white matter), association fibers of the temporal and occipital lobes (bilateral inferior fronto-occipital fasciculus, optic radiation, anterior cingulum, right anterior, right superior, and bilateral corona radiata, right anterior limb of the internal capsule, right external capsule, and right superior frontal gyrus) and in the corpus callosum (genu and anterior portions), when compared with the swimmers group. A measure of axonal integrity (axial diffusivity) was higher in soccer players in the corpus callosum when compared to swimmers. No FA differences were observed between groups. “The origin of these results is not clear. One explanation may be the effect of frequent subconcussive brain trauma, although differences in head injury rates, sudden accelerations, or even lifestyle could contribute,” said Dr. Martha Shenton, PhD, senior author and a researcher at the VA Boston Healthcare System and Brigham and Women’s Hospital. “Additional research is needed to confirm these results we observed in this small sample of soccer players and to help clarify the effects that alterations of white matter have on behavior and health.”
Our "Lab Friendly Family Program" aims to promote cultural exchange opportunities between our Portuguese families and foreign students who come to experience our lab.

International cooperation has been one of the biggest bets of our lab, and the Lab Friendly Family program seeks to enrich the experience of international students who choose our lab as a temporary residence, as well as offer an opportunity for the local community to participate in this initiative.

There are huge rewards resulting from this participation of being a host family. Foreign visitors are not the only ones who will benefit from being a guest of a local citizen, who will facilitate the adaptation in Portugal, introduce Portuguese culture, and help with the early challenges in adapting to a new culture, but the host family itself will have the opportunity to make a new friend, learn about a new culture, their values, traditions, practice a new language and such. Both, the visitors and host Portuguese families will be enriched by this cultural exchange during the period of this program.

We hope you'll join us!

Who can be "our lab’s friend"?

→ Who has a room available and can provide up to a month (Including a room, bathroom, power, and breakfast) to a foreign student;

→ Who is sensitive to cultural differences and is capable of basic communication in English;

→ Who can move daily to the University of Minho, or reside in any area of the city that provides public transport, allowing guests an independence of movement to and from our lab.

If you have any questions about the program, send an email to Patrícia Oliveira-Silva at clednasilva@psi.uminho.pt.
CONGRATULATIONS!

AND THE WARMEST WELCOME TO THE NEWEST MEMBER OF THE LAB!

ADRIANA SAMPAIO AND HER HUSBAND WERE BLESSED WITH A HEALTHY AND HAPPY NEW FAMILY MEMBER.

ALL THE BEST FROM ALL OF US AT NPL!!!
Lab Team

Óscar F. Gonçalves, PhD (Lab Director)

Adriana Sampaio, PhD (Researcher)
Ana Ganho, MSc (PhD Student)
Ana Mesquita, PhD (Researcher)
Ana Osório, PhD (Post-Doc)
Agavni Petrosyan, PhD (Researcher)
Ana Pinheiro, PhD (Post-Doc)
Ana Ramos (Intern)
Catarina Fernandes, MSc (PhD Student)
Fernando Macedo (Lab Technician)
Génesis Santos (Intern)
Helga Miguel, MSc (PhD Student)
Joana Coutinho, PhD (Post-Doc)
Joel Figueiredo (Intern)
Jorge Alves, MSc (PhD Student)
Jorge Leite, PhD (Post-Doc)
Júlia Egito (Visiting Student)
Liliana Maia, MSc (Collaborator)
Lucas Marques (Visiting Student)
Luciana Gomes, MSc (PhD Student)
Miguel Soares, MSc (Collaborator)
Patrícia Oliveira Silva, MSc (PhD Student)
Rosana Magalhães, MSc (PhD Student)
Sandra Carvalho, PhD (Post-Doc)
Silvana Costa, MSc (PhD Student)
Sónia Sousa, MSc (PhD Student)
Sara Cruz, MSc (PhD Student)
Sara Fernandes (Intern)
Tatiana Magro, MSc (PhD Student)
Teresa Silva, MSc (Intern)