Editorial

IMCEN - 1st Call Now Open

Óscar F. Gonçalves, PhD – Program Director

This is it! The call is now open for the first edition of our Inter-university Master in Clinical and Experimental Neuropsychology.

Applicants can look for all the information about IMCEN on our official webpage - https://www.psi.uminho.pt/en/education/imcen/

There, you can find information regarding the training program, student/seed, teaching model, faculty, resident and associated labs, student/candidates and, of course, our past and future newsletters. If you want to have glimpse of what the first semester is going to look like, go to the syllabi for the 1st semester courses. On the last page of this newsletter you’ll find additional hints for the application process.

In this newsletter we keep providing information regarding research and educational activities associated with IMCEN. In the section “Faculty Awards” we have an interview with IMCEN faculty member and program coordinator Oscar Gonçalves regarding his recent honorary mention for the Bial Award in Clinical Medicine with the work “Neurosciences of OCD (NoOCD): Towards a Brain Based Clinical Intervention”.

As in previous editions we continue the presentation of relevant “Faculty Publications”. This time, we featured an important article by IMCEN faculty member Ana Raposo and colleagues published in Neuropsychologia “Framing memories: how the retrieval query format shapes the neural bases of remembering”.

IMCEM maintains a network of research collaboration with several neuroscience labs around the world. In the issue we list and map those labs. This network is a core resource for supporting teaching and research in IMCEN.

Finally, continuing our “Program Highlights” section, we introduce, this time, the course “Research Methods in Neuropsychology” as an example of a hands-on course of the first semester of the IMCEN. This course, coordinated by Ana Raposo and with the contribution of faculty from the IMCEN sites, was designed to provide a rigorous introduction to some of the main research methods in neuropsychology.

This is the last Newsletter before welcoming our first cohort of IMCEN students. I wish you all the best of luck with your application procedures.

Hope to see you in September!

Online Applications

July 01 - July 24

https://alunos.uminho.pt/EN/candidates/Master\sDegrees\Pages/default.aspx
Faculty Awards Highlights

An Interview with Óscar F. Gonçalves, PhD

The BIAL Award was created in 1984, with the aim of encouraging and promoting highly influential works in the area of medical research. The award has been awarded biannually, enjoying the support and collaboration. Recognising and distinguishing basic and clinical research, the BIAL Ward in Clinical Medicine, amounting to a total of 100,000 €, seeks to recognize a written work on any freely chosen medical topic of high intellectual quality and aimed at clinical practice. In the last edition IMCEN faculty member Óscar Castro Fernandes MD, along with Ana Castro Fernandes MD, were awarded the honorary mention for their work “Neurosciences of OCD (NoOCD): Towards a Brain Based Clinical Intervention”. Here we interviewed Prof. Oscar Goncalves about this work and its relevance for clinical neuropsychology.

Can you briefly summarize the work which was awarded with the most recent edition of the Bial Clinical Medicine Wards?

Obessive Compulsive Disorder (OCD) is one of the most challenging disorders. While most of the treatment algorithms recommend exposure and response prevention (ERP) as a first line approach (supplemented with SSRI medication in case of moderate to severe OCD), still a significant number of patients fail to comply or benefit from ERP. In our clinical experience with OCD patients we were puzzled by the fact that, when patients were being exposed to symptom provoking cues, they seemed to be suppressing advanced visual processing of incoming stimuli. The lack of an advanced sensory processing for emotional charged stimuli would be a major limitation to the efficacy of the exposure treatment (ERP). We thought, at that time, that the suppression of sensory stimuli might be associated with an anterior-posterior brain dissociation characterized by the hyperactivation of fronto–subcortical regions and a correlative deactivation of occipital–parietal areas and, possibly, an interhemispheric imbalance due to ineffective thalamic filtering.

During the last decade we launched a series of neuroimaging studies with our OCD clinical samples aimed at understanding the brain mechanisms associated with cognitive and emotional impairments in OCD. We showed that morphological abnormalities are not restricted to frontal and subcortical regions but also extend to several temporal and parietal regions as well. Additionally, neuroimaging functional studies from our group, suggested the existence of an emotional imbalance. OCD patients show an intensive reaction to triggers of the defensive emotional system (e.g., threat) while suppressing the processing of appetitive emotional triggers (e.g., pleasure).

Data from our research group shows that OCD should be approached both as cognitive (i.e., inhibitory control, working memory, cognitive flexibility impairments) and as an emotional disorder (i.e., imbalance between appetitive and defensive emotional systems).

What was the relevence of this award for your research and academic career?

Bial Awards are among the most competitive medical awards in Europe. The selection panel included professors from all Portuguese Medical Schools and was chaired by one of the world top pathologist – Professor Manuel Sobrinho Simões. This edition had about 100 candidates. It was a distinct honor being selected as one of the three awardees. To the best of my knowledge this is the first time that the work lead by a psychologist is selected for the Bial Clinical Medicine Awards. As an additional treat the selection panel invited Professor Rui Costa (see image above) from Columbia University to comment our work. To receive the support and encouragement by one of the most distinct world neuroscientist it is something that I will treasure in my academic memories.

What do you see as the major implications for clinical neuropsychology?

In translational terms the challenge for the OCD treatment is to find effective ways of improving inhibitory control, working memory and cognitive flexibility while restoring the balance between defensive and appetitive emotional systems. From our research we derived a neuropsychological treatment approach to OCD (NoOCD) grounded on our current understanding of the main brain functional and structural alterations. The main objective of NoOCD is to increase inhibitory control, working memory and cognitive flexibility while restoring emotional balance relying on a sequence of clinical strategies initially developed in neuropsychology (Go/No Go Training; N-Back training; Task-Switch Training). This is, I believe, the first neuropsychological treatment approach to OCD targeting both cognitive and affective impairments.
Faculty Best Practices

An interview with Mário R. Simões, PhD

Mário R. Simões is on the core faculty of the IMCEN. He is Full Professor and Director of PsyAssessmentLab. He is a licensed psychologist with board certification in Neuropsychology by the Portuguese Psychological Association. His PsyAssessmentLab was instrumental in the adaptation and/or validation of more than 30 tests and other (neuro) psychological assessment instruments for the Portuguese population. In this interview Dr Simões introduces the PsyAssessmentLab.

Mario, you currently direct what I believe is the only Lab in Portugal focused on Psychological Assessment. Would you please provide details on what motivated you to launch this Lab?

The PsyAssessmentLab was created in 2012, replacing the Psychological Assessment Service (created in 1982, by Prof. Aura Montenegro), with the aim of integrating researchers and professors (including former and current PhD students) of the Faculty of Psychology of the University of Coimbra who shared research, teaching and professional practice in the areas of psychological and neuropsychological assessment. The interest in (neuro)psychological assessment and in the implementation of systematic research programs for adaptation, development, validation and standardization of psychological/neuropsychological assessment instruments is the common denominator of the PsyAssessmentLab team.

Tell us more how the lab evolve during the last few years?

Systematic research work on the adaptation, psychometric and clinical validation and norming for portuguese population of several "classic" tests and other instruments like Beck Depression Inventory (BDI-2); Eysenck Personality Questionnaire – Revised (EPO-R); Wechsler Intelligence Scale for Children – Third Edition (WISC-III); Wechsler Adult Intelligence Scale-Third Edition (WAIS-III).

Concerning aging and related neuropsychological assessment, it’s worth referring the research that includes validation with clinical samples like mild cognitive impairment and Alzheimer’s disease with the Addenbrooke Cognitive Examination-Revised (ACE-R) and Mini-Mental State Examination (MMSE), for cognitive screening; the Free and Cued Selective Reminding Test (FCSRT) and computerized tests like the Cambridge Neuropsychological Automated Tests for the Assessment of Dementia (CANTAB Alzheimer), for memory evaluation; EcoKitchen (a novel ecological task designed to evaluate planning, multi-tasking, set-shifting, cognitive flexibility, self-monitoring, sequencing, divided attention, and scanning skills, for Parkinson and Huntington diseases); the Geriatric Depression Scale (GDS-30) or the validation with the European Portuguese WHOQOL-OLD module, for quality of life. It is also important to mention the adaptation, validation and norming research with instruments relevant for forensic neuropsychological assessment, specifically for the detection of malingering, poor effort or symptom exaggeration concerning several performance validity tests (e.g., Test of Memory Malingering (TOMM), Rey-25 Item Memory Test) and symptom validity tests (e.g., Structured Inventory of Malingered Symptoms [SIMS], Symptom Validity Scale (EVS-2), original instrument developed in our Lab) and the new Self-Report Symptom Inventory (SRSI), that includes prison, medico-legal, institutionalized juvenile offenders, and mild cognitive impairment samples.

What is the lab major contributions in the area of neuropsychology?

Systematic work on the adaptation, validation and norming for portuguese population of the neuropsychological tests relevant for the protocols of neuropsychological assessment namely in pediatric, geriatric and forensic neuropsychological assessment is supported by numerous national and international publications (articles, book chapters). These kind of research with (neuro)psychological tests and other instruments was often supported by a PhD scholarships from Portuguese Foundation for Science and Technology (FCT) and by research projects funded by FCT and Calouste Gulbenkian Foundation. Two additional examples of our team contributions. One is the Coimbra Neuropsychological Assessment Battery (BANC), for children and adolescents, that includes 15 neuropsychological tests and enables the assessment of important neurocognitive functions (memory, language, attention, executive functions, laterality, orientation and motor function), with many validity studies with neurodevelopmental disorders and other special condition groups (e.g., Developmental Dyslexia, Hyperactivity/Attention Deficit Disorder, Oppositional Defiant Disorder; Epilepsy, Traumatic Brain Injury Mild Intellectual Disability; Borderline Intelectual Functioning; Intellectual giftedness; Language Impairment). Another is the Montreal Cognitive Assessment (MoCA), a well-known screening test for the evaluation of cognitive impairment in adult and aging population and with studies in relevant clinical groups (Mild Cognitive Impairment, Alzheimer’s Disease, Vascular Dementia, Frontotemporal Dementia, Multiple Sclerosis). Also, the construction and the development of novel/original instruments relevant neuropsychological assessment protocols in aging clinical conditions: the Irregular Word Reading Test (TeLP), for the estimation of premorbid intelligence), The Adults and Older Adults Functional Assessment Inventory (IAFA), for functional daily life activities) are part of our activities.

What is the lab major contributions in the area of neuropsychology?

It is expected that IMCEN students will continue this kind of research with new clinical and psychometric research with some of these instruments administered to specific groups that have not yet been studied or other instruments that are currently being studied by members of our Lab. We are also interested in students that bring new ideas and challenges in the development and validation of new instruments.

To know more about PsyAssessmentLab visit http://psyassessmentlab.fpce.uc.pt
Faculty Publication

Highlights

Framing memories: how the retrieval query format shapes the neural bases of remembering
A paper by Ana Raposo, PhD

Here we present a landmark paper by Ana Raposo, PhD. Ana Raposo is on the core faculty of the IMCEN program. Currently, she is an Assistant Professor at Faculty of Psychology - University of Lisbon and member of the Research Center for Psychological Science (Memory and Language Lab). She is currently executive director of the Mind-Brain College of ULisboa. She received her PhD from the University of Cambridge and conducted postdoctoral research at Duke University. She is interested in the cognitive and neural bases of human memory. Her research combines behavioral and neuroimaging (fMRI) methods to gain a better understanding of the mechanisms that support retrieval of past experiences and expression of knowledge.

Since the landmark “car crash experiment” by Loftus and Palmer (1974) it is well known that the way questions are framed influences the information we retrieve from memory. In that study, participants watched a film of a car crash, and were subsequently asked to recall the speed of the vehicles when they collided. Participants evoked higher speeds when the question was “How fast were the cars going when they smashed each other?” than for the question “How fast were the cars going when they contacted with each other?”. Thus, people’s memory may be biased by the way questions are asked.

Building on these results, we investigated how questions should be framed in order to promote accurate and detailed recollection of past experiences. In an fMRI study, participants encoded lists of words using a semantic task (“Is this word pleasant?”) or using a perceptual task (“Does the word have 6 or more letters?”). Then, during retrieval, they saw words presented before along with new words. Importantly, the retrieval question was manipulated such that it could emphasise the semantic task (“Did you perform the pleasantness judgment on this word?”) or the perceptual task (“Did you perform the letter decision on this word?”), regardless of the actual encoding task.

In line with previous studies, source recollection was greater for items encoded in a semantic manner than in a perceptual manner. Besides, we showed that framing the question in a semantic manner also improved recollection, regardless of whether the item had been encoded in the semantic or perceptual task. At a neural level, the semantic query (relative to the perceptual query) elicited greater activation in lateral and medial prefrontal cortex, two key regions in memory retrieval. These results highlight that the way questions are framed influence the information that comes to mind and how it is used during remembering.

We believe that these findings have important clinical applications. Neurological changes during healthy aging and a host of clinical disorders severely impact memory recollection but often keep semantic abilities intact. Determining how semantic cues aid memory decisions via prefrontal cortex activation is therefore critical in coping with the significant memory decline in these populations.

To know more about Ana Raposo, visit http://www.araposo.com

Ana Raposo’s Memory and Language Research Team
**International Associated Labs**

IMCEN maintains a network of research collaboration with several neuroscience labs around the world. Our students are strongly encouraged to take advantage of this network for short and long-term research residence as well as for advisorship on their research projects/thesis. Faculty from these collaborating labs will be occasionally invited to participate via live or online modules in IMCEN. The International Associated Labs Network includes, currently, the labs listed below:

| CAOS Laboratory, Carnegie Mellon University, USA |
| Angelika Lingnau's Group, Regensburg University, Germany |
| Jens Schwarzbach Group, Regensburg University, Germany |
| Mel Goodale's laboratory, Western University, Canada |
| Jody Culham's laboratory, Western University, Canada |
| Serge Dumolin's Lab, Spinoza Ct. for Neuroimaging, Netherlands |
| Cognitive and Affective Sciences Lab, University of Lille, France |
| Basic & Applied Neurodynamics Lab, Maastricht U, Netherlands |
| Psychiatry Neuroimaging Lab - Harvard Medical School, USA |
| Social & Cognitive Neuroscience Laboratory, Mackenzie U., Brazil |
| Spaulding Neuromodulation Ct, Spaulding Reh. Hospital, USA |
| Neuropsychiatry Unit, Champalimaud Foundation, Portugal |
| Computational Cognitive Science Lab, University of East London, UK |
| Sleep Lab & Health Promotion of the U. of Granada, Spain |
Research Methods in Neuropsychology is a hands-on course of the first semester of the IMCEN. It is designed to provide a rigorous introduction to some of the main research methods in neuropsychology. Faculty members from the 3 universities, experts in the different methodologies, are involved in this course. Ana Raposo is the coordinator and discusses, in this interview, the main features of the course.

Would you briefly describe this course?

The course focuses on 5 key methods in neuropsychology: behavioural methods, event-related potentials, brain stimulation, structural and functional magnetic resonance imaging. It will cover both the basic principles of experimental design and the specificities of the different methods.

Why do you focus on these 5 methods?

These are some of the most commonly used methods in neuropsychology. They provide distinct, but complementing information about various cognitive functions and their neural underpinnings. For example, while EEG provides information about how cognitive processes unfold in time, fMRI offers a map of where these processes occur. In almost all fMRI studies, behavioural data such as accuracy and response times are collected as these are very informative about what the person is doing while performing the task. Thus, the use and integration of multiple methods offers a wide-angle view of the mind, brain and behaviour. Another reason for choosing these specific methods is that IMCEN faculty members are experts on these techniques having extensive experience in applying them both in the clinical and experimental contexts.

All workshops include a theoretical component and a practical hands-on component. As such, regular attendance and participation of the students is required. Student to student interaction will be a vital part of this course.

What are the learning outcomes expected from Research Methods in Neuropsychology?

We expect students to develop critical thinking skills about the strengths and limitations of each method and to be able to select appropriate methods for their studies depending on the research questions at hand. In the end of this course, students should be able to plan the different steps associated with data collection, carry out the processing steps associated with data analyses and be able to interpret the results. One important part of the course will be the use of the available software packages for stimuli presentation, data collection and analysis, including EPrime, Matlab, SPM, among others.

Tell us more about how the course will be run.

The course consists of 5 full-day workshops in the 3 campi distributed along the semester. Each workshop will be led by an IMCEN faculty member.

Check the Course Syllabus Already Available Online

INTERUNIVERSITY MASTER IN
Clinical and Experimental Neuropsychology

Presentation

The Interuniversity Master in Clinical and Experimental Neuropsychology (IMCEN) is an innovative graduate program joining the faculty and research resources from three Portuguese universities (U. Coimbra, U. Lisboa e U. Minho) with the objective of training students in providing and innovating neuropsychology practice grounded on the most recent developments taken place in experimental neurosciences.

Training Program

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<td>Functional Neuroanatomy</td>
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Meet our Core Faculty

Ana Pinheiro
University of Lisboa

Ana Raposo
University of Lisboa

Mário R. Simões
University of Coimbra

Jorge Almeida
University of Coimbra

Oscar F. Goncalves
University of Minho

Adriana Sampaio
University of Minho

Schedule 1st Call

Applications: July 1 – 24

Results: July 31

Registration: August 5 – 9

Welcome to IMCEN

Before you apply

- Get familiar with Faculty Research
- Explore Lab Resources
- Prepare a personal statement
- Establish your objectives
- Match your objectives with Faculty Expertise and Program Resources

Prepare your CV
- Organize your transcripts
- Contact your referee

Show who you are

- Apply
- Rank your Campus choice
- Submit your application
- Prepare for the interview