Yseult Héjja-Brichard

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RESEARCH INTERESTS

I am currently finishing my PhD studies in cognitive neuroscience and more specifically on depth perception (3D vision) in primate, with a link with natural statistics. For my next research interests, I aim to dive into the fields of sensory ecology and cognitive ecology to further investigate how sensory systems and cognitive functions of different species are shaped by or adapted to the environment in which they evolve.

EDUCATION

PhD studies Neuroscience, Cognition, and Behaviour **2015-Present**
Université Paul Sabatier and CerCo (CNRS), Toulouse, France

Supervisor: Benoit R. Cottereau, within the Eco-3D team.
Title of the thesis: Spatial and temporal integration of binocular disparities in primates.

Synopsis: My PhD project aims to provide a better understanding of how the visual system in primates processes binocular disparities in space and time. I also investigate the relationship between the 3D properties of the environment and neural responses. I mostly conduct functional neuroimaging studies in macaque and collect psychophysics measurements in human and macaque.

Msc in Neuroscience, Cognition, and Behaviour (2nd year) **2015**
Université Paul Sabatier, Toulouse, France

Research project: "Characterisation of the cortical networks involved in 3D orientation processing in primates." at CerCo, Toulouse. Supervised by Benoit R. Cottereau & Jean-Baptiste Durand.

Msc in Cognitive and Social Psychology (1st year) **2014**
Université de Grenoble-Alpes, Grenoble, France

Research project: "Role of the eyes in face categorisation: Interracial eye change impacts on the other-race effect in a categorisation task." at LPNC, Grenoble. Supervised by Olivier Pascalis.

Internship in Neuropsychology at the Hospital of Grenoble, France (January-February 2014)

Bsc in Psychology **2013**
Université de Grenoble-Alpes, France & Universität Leipzig, Germany

Research assistant at the Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany - Department of social neuroscience (April-July 2013). Supervised by Natacha Mendes.
In charge of the coding of chimpanzees' vocalisations collected for an experiment investigating Schadenfreude.

SCIENTIFIC PRODUCTION

Publications

Under review

- **Héjja-Brichard, Y.**, Rima, S., Rapha, E., Durand, J.-B. & Cottereau, B.R. (*under review*). Stereomotion processing in the non-human primate brain. [Preprint & OSF project]

- Rima, S., Cottereau, B.L., **Héjja-Brichard**, Y., Trotter, Y. & Durand, J.B. (*under review*). A new visuotopic cluster in macaque posterior parietal cortex revealed by wide-field retinotopy.

Peer-reviewed journal articles

- Cottereau, B.R., Smith, A.T., Rima, S., Fize, D., **Héjja-Brichard, Y.**, Renaud, L., … & Durand, J.-B. (2017). Processing of Egomotion-Consistent Optic Flow in the Rhesus Macaque Cortex. *Cerebral Cortex*, 1-14. https://doi.org/10.1093/cercor/bhw412

Presentations

Invited talks

- **Héjja-Brichard, Y.** & Mercier M.R. (2018). Data visualisation in cognitive neuroscience: Functional neuroimaging and electrophysiology. Talk given for the Toulouse Data Vizualisation group, Toulouse [Slides]
- **Héjja-Brichard, Y.** (2018). Open Science: Why and How? Talk given at the CerCo's Young Scientist Meeting, Toulouse [Slides]
- Beffara, B., Nalborczyk, L., **Héjja-Brichard, Y.**, & Bret, A. (2017). Open, slow and sustainable science. Talk given at the PhD student day of the LPNC, Grenoble, France.

Conference talks

- Audurier, P., **Héjja-Brichard, Y.**, Kohler, P.J., Norcia, A.M., Durand, J.-B., Cottereau, B.R. (2019). Processing of rotational symmetry in the non-human primate brain. Talk given at the annual meeting of the French research group 'GDR Vision', Marseille, France.

Conference posters

- Audurier, P.*, **Héjja-Brichard, Y.***, Kohler, P.J., Norcia, A.M., Durand, J.-B., Cottereau, B.R. (2019, October). Processing of symmetry in the non-human primate brain. Society for Neuroscience, Chicago, USA.
- De Castro, V.*, LeGuen, C.*, **Héjja-Brichard, Y.**, Audurier, P., Cottereau, B.R., Durand, J.-B. (2019, October). Functional and structural connectivity of the cingulate sulcus visual (CSv) area in macaque monkeys. Society for Neuroscience, Chicago, USA.
- **Héjja-Brichard, Y.**, Bruzzone, S.E.P., Rapha, E., Durand, J.-B., Cottereau, B.R. (2019, September). Influence of natural statistics on depth perception. Predictive Brain Conference, Marseille, France.
- **Héjja-Brichard, Y.**, Rima, S., Rapha, E., Durand, J.-B., Cottereau, B.R. (2018, November). Stereomotion processing in the non-human primate brain. Society for Neuroscience, San Diego, USA.
- Rima, S., Cottereau, B.R., **Héjja-Brichard, Y.**, Trotter, Y., Durand, J.-B. (2017, November). Wide-field retinotopy reveals a new visuotopic cluster in IPS. Society for Neuroscience, Washington, USA.
- **Héjja-Brichard, Y.**, Rima, S., Durand, J.-B., Cottereau, B.R. (2017, August). Stereomotion processing in the non-human primate brain. European Conference on Visual Perception, Berlin, Germany.

* equal contributions

RESEARCH SKILLS

Software

- Programming: Matlab, Rstudio, C#
- Neuroimaging: SPM12, caret5 (surface-based software for monkey data), PRoNTo (Pattern recognition toolbox)
- Stimulus presentation: EventIDE (advanced), PsychToolbox (basics), Eprime
- Writing: LaTeX, RMarkdown, Office
- Graphics editor: Adobe Illustrator, Photoshop
- Data sharing: Github, Open Science Framework, bioRxiv

Data analysis

- fMRI data analyses: whole-brain, region-of-interest-based, and retinotopic analyses; MVPA
- Psychophysical data modelling
- Eye-tracking analysis (basics)

TEACHING EXPERIENCE

Teaching assistant (2015-2018) for Bsc Biology students (2nd and 3rd year)
Department of neuroscience and behavioural science, Université Paul Sabatier, Toulouse, France.
Practical works ('TP') and tutorial classes ('TD')

2017-2018

Nervous and cerebral functions (BCP, 3rd year)	TD: 4h & TP: 33h
Behavioural ecology (BOPE, 3rd year)	TP: 27h

2016-2017

Neurophysiology (BCP, 2nd year)	TD: 4h
Nervous and cerebral functions (BCP, 3rd year)	TD: 4h & TP: 36h
Behavioural ecology (BOPE, 3rd year)	TP: 21h

2015-2016

Neuroscience (BCP, 2nd year)	TP: 24h
Nervous and cerebral functions (BCP, 3rd year)	TD: 6h & TP: 28h
Behavioural ecology (BOPE, 3rd year)	TP: 6h

BCP: Cell Biology and Physiology; BOPE: Organisms, Populations, and Ecosystems Biology

Student supervision

- 2019: Master's student in Neuroscience, Università degli studi di Trieste, Italy - Psychophysics
- 2018: Master's student in Neuroscience, University of Bordeaux, France - fMRI analyses

Volunteering French teacher

- 2015-2016: Teaching French as a foreign language (FLE) to adults for the NGO "Croissant Fertile", Toulouse, France

EXTRACURRICULAR ACTIVITIES

Lab Community Involvement

- Student representative at the Lab Council (2017-2018)
- Organisation of the Lab Winter School (2017, 2018)

- Co-organisation of the Annual 'CerCo Day' (2016)
- Ambassador for the Center for Open Science: COS (2018-present)
- Development of a collective with other young researchers to promote open and slow science (http://slowpen.science/)

Personal Implication in Science Popularisation

- Public presentation on visual illusions (March 2019) for the Brain Awareness Week at Quai des Savoirs, a cultural centre in Toulouse: "Les illusions visuelles, une illusion du cerveau?"
- Public presentation on the study of 3D vision in animals (Feb. 2017) "En tête à tête avec un jeune chercheur", Museum de Toulouse: "La vision 3D : mieux qu'au cinéma !"
- Article written for the Museum of Natural sciences of Toulouse (March 2017, in French) about the evolution of 3D vision in animals. - Yseult Héjja-Brichard & Benoit R. Cottereau "Evolution et vision : le vivant a de la profondeur !"
- Communications manager and board member of InCOGnu - an organisation of students and young researchers in cognitive science in the Toulouse area.
  Organisation of monthly conferences, workshops for the general public (both adults and children) and participation in various events of science popularisation (Pint of Science, EuroScience Open Forum, Brain Awareness Week, National Forum of Cognitive Science).

Complementary skills and training

- **Languages –** French (native), English (full proficiency, Toefl iBT: 104/120), German (good command in speaking, level B2), Spanish (basic communication skills, level B1).
- **Methodological improvement –** Workshops in statistical analyses and in ethics
- **Certification –** Experimental research design in non-human primates, June 2016 (CNRS Marseille)