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SCHOLARLY PROFILE

As a broadly-trained cognitive neuroscientist, I concentrate on the interaction between lateralized visual and attention processing regions, and the impact of that interaction on behavior. I investigate large- and fine-scale functional dependency within networks and excitatory-inhibitory interactions between lateralized processing regions which result in stable visual perception. My experimental methods include brain stimulation with TMS and tES, brain imaging using fMRI and EEG, and eye-tracking.

RESEARCH EXPERIENCE

2020 - **Staff Scientist,** Laboratory of Brain and Cognition, NIMH, NIH
Supervisor: Christopher I. Baker, Chief of the Section on Learning and Plasticity

2019 - 20 **Visiting Fellow,** Laboratory of Stroke Motor Recovery, MRRI
Advisor: Dylan Edwards, Director of Moss Rehabilitation Research Institute
Project: Improving left visual field spatial attention in patients with right cerebrovascular accident.

2017 - 20 **Postdoctoral Fellow,** Psychology Department, Harvard University/IIT
Advisor: Lorella Battelli, Assistant Professor of Neurology
Project: Investigating the temporal dynamics of cortical stimulation in the attention network using eye-tracking, TMS, tES, & fMRI.

2015-16 **Postdoctoral Fellow in Cognitive Neuroscience,** CerCo, Toulouse
Advisors: Patrick Cavanagh, Professor of Psychology, Université Paris Descartes
Rufin VanRullen, CNRS Researcher, CerCo, Toulouse
Project: Investigating predictive position mechanisms in vision using eye-tracking, TMS and EEG.

EDUCATION

2014 **Ph.D. in Neuroscience & Biomedical Systems**, University of Glasgow, Scotland
Thesis: Predictive feedback to the primary visual cortex during saccades
Advisor: Lars Muckli, Professor of Psychology and Cognitive Neuroimaging

2011 **MSc. in Brain Imaging**, University of Glasgow, Scotland
Thesis: Interhemispheric remapping of visual predictive signals in V1 using fMRI
Advisor: Lars Muckli, Professor of Psychology and Cognitive Neuroimaging

2010 **BSc. in Psychology**, University of Glasgow, Scotland

PUBLICATIONS

Journal Articles

1. Carroll, M. B*., **Edwards, G.*** & Baker, C. I. (2022). Replicating the facilitatory effects of transcranial random noise stimulation on motion processing: A registered report. *Peer Community In Registered Reports.* Stage 1 acceptance. (*equal contribution).

2. van der Groen, O., Potok, W., Wenderoth, N., **Edwards, G.,** Mattingley, J. B., & Edwards, D. (2022). Using noise for the better: The effects of transcranial random noise stimulation on the brain and behavior. *Neuroscience & Biobehavioral Reviews*, *138*, 104702.
3. Contò, F., **Edwards, G.,** Tyler, S., Parrott, D., Grossman, E., & Battelli, L. (2021). Attention network modulation via tRNS correlates with attention gain. *ELife*, *10*, e63782.
4. **Edwards, G.,** Berestova, A., & Battelli, L. (2021). Behavioral gain following isolation of attention. *Scientific Reports*, *11*(1), 19329.
5. Teichmann, L., **Edwards, G.,** & Baker, C. I. (2021). Resolving visual motion through perceptual gaps. *Trends in Cognitive Sciences*, *25*(11), 978–991.
6. **Edwards, G.,** Contò, F., Bucci, L. K., & Battelli, L. (2020). Controlling Brain State Prior to Stimulation of Parietal Cortex Prevents Deterioration of Sustained Attention. *Cerebral Cortex Communications*, *1*.
7. **Edwards, G.,** Agosta, S., Herpich, F., Contò, F., Parrott, D., Tyler, S., Grossman, E., & Battelli, L. (2019). Prolonged Neuromodulation of Cortical Networks Following Low-Frequency rTMS and Its Potential for Clinical Interventions. *Frontiers in Psychology*, *10*, 422592.
8. **Edwards, G.,** VanRullen, R., & Cavanagh, P. (2018). Decoding Trans-Saccadic Memory. *Journal of Neuroscience*, *38*(5), 1114–1123.
9. **Edwards, G.,** Vetter, P., McGruer, F., Petro, L. S., & Muckli, L. (2017). Predictive feedback to V1 dynamically updates with sensory input. *Scientific Reports*, *7*(1), 16538.
10. **Edwards, G.,** Paeye, C., Marque, P., VanRullen, R., & Cavanagh, P. (2017). Predictive position computations mediated by parietal areas: TMS evidence. *NeuroImage*, *153*, 49–57.
11. Vetter, P.*, **Edwards, G.*,** & Muckli, L. (2012). Transfer of predictive signals across saccades. *Frontiers in Psychology*, *3*, 176. (*equal contribution).

In preparation

Edwards, G., Buxbaum, L.J., Chen, G., Edwards, D., & Battelli, L. Improving visual attention following right hemisphere stroke: A preliminary study

Teichmann, L., Behel, A., **Edwards, G.** & Baker, C. I. Representation of an object through visual occlusion

Kim, J., Joynes, C., **Edwards, G.,** Baker, C. & Merriam, E. Responses in human early visual cortex are more sensitive to task difficult than object category.

Media Exposure & Podcasts

My research has been reported on the BBSRC website, International Business Times, MedicalXpress, Neuroscience News, The Conscious Mind, Reliawire, & Paper Boys Podcast.

PRESENTATIONS

Invited Lectures

Visual and Cognitive Neuroscience Lab, Switzerland (2022)
Brain and Mind Institute, EPFL, Switzerland (2022)
Institute of Psychology, University of Lausanne, Switzerland (2022)
Centre for Integrative Neuroscience, University of Tübingen, Germany (2022)
Centre de Recherche Cerveau & Cognition, Toulouse, France (2022)
Laboratory of Brain & Cognition, NIH, Bethesda, MD, USA (2019)
SUNY New Paltz, New Paltz, NY, USA (2019)
Moss Rehabilitation Research Institute, Philadelphia, PA, USA (2019)
McGovern Institute for Brain Research, MIT, Cambridge, MA, USA (2018)
Mind Brain Behavior Interfaculty Initiative, Harvard University, Cambridge, MA, USA (2016)
Center for Neuroscience and Cognitive Systems, Rovereto, Italy (2015)

Centre de Recherche Cerveau & Cognition, Toulouse, France (2014)
Department of Psychiatry and Psychotherapy, Charité – Universitätsmedizin Berlin, Germany (2014)
Department of Psychology, University of Washington, Seattle, WA, USA (2013)

Conference Talks

Visual integration plays a critical role when processing motion through periods of occlusion. Teichmann, L., Behel, A.K., Edwards, G., & Baker, C.I. ECVP, Nijmegen, Netherlands (2022).

Mechanisms of space and time in healthy and diseased brain. Edwards, G., Contò, F., & Battelli, L. Symposium talk: The spatial character of temporal processes. ECVP, Leuven, Belgium (2019).

Late enhancement of visual attention after multi-method brain stimulation**.** Edwards, G., Contò, F., Bucci, L., & Battelli, L. ECVP, Trieste, Italy (2018)

EEG decoding of pre-saccadic effects on post-saccadic processing. Edwards, G., VanRullen, R., & Cavanagh, P. VSS, St. Pete Beach, Florida, US (2017)

Predictive position percepts mediated by parietal areas: TMS evidence. Edwards, G., Paeye, C., Marque, P., VanRullen, R., & Cavanagh, P. VSS, St. Pete Beach, Florida, US (2016)

Cortical predictions interact with post-saccadic input to the primary visual cortex. Edwards, G., & Muckli, L. Neuroscience Workshop Saclay, Gif-sur-Yvette, France (2016)

Cortical feedback to primary visual cortex during inter-hemifield saccades. Edwards, G. & Muckli, L. Symposium talk: Triple P: Pre-, peri- and post-saccadic perception. ECEM, Vienna, Austria (2015)

What you see is what you get? Top-down, predictive influences on visual perception Edwards, G. 3 Minute Thesis Competition, University of Glasgow (2013)

The transference of predictive signals across saccades. Edwards, G., Vetter, P., & Muckli, L. Scottish Vision Group. Dunkeld, Scotland (2010)

Posters and abstracts

Representation of an object through visual occlusion. *Journal of Vision*, *23*(9), 5912. Behel, A., Teichmann, L., Edwards, G., & Baker, C. (2023).

Object position estimation through periods of occlusion. Behel, A.K., Teichmann, L., Edwards, G., & Baker, C.I. SfN, San Diego, US (2022).

Pre-saccadic information interacts with post-saccadic processing in V1. Edwards, G., Merriam, E.P., & Baker, C.I. OHBM, Glasgow, UK. (2022)

Pre-saccadic information interacts with post-saccadic processing in V1. Edwards, G., Merriam, E.P., & Baker, C.I. VSS, St. Pete Beach, Florida, US. (2022)

Improving left visual field attention in right unilateral stroke patients. Edwards, G., Buxbaum, L., Edwards., D., & Battelli, L, Virtual VSS (2021)

Probing mutual inhibition between attention regions using attention isolation. Edwards, G., Berestova, A., & Battelli, L., Virtual VSS. (2020)

Late enhancement of sustained attention with cortical priming prior to rTMS. Edwards, G., Contò F., & Battelli L., SfN, Chicago, US. (2019).

Late enhancement of visual attention after multi-method brain stimulation. Edwards, G., Contò, F., Bucci, L., & Battelli, L. VSS, St. Pete Beach, Florida, US. (2018)

Long-term functional connectivity changes across the dorsal attention network after transcranial electrical stimulation. Contò, F., Edwards, G., & Battelli, L. VSS, St. Pete Beach, Florida, US. (2018)

Cortical predictions interact with post-saccadic input to the primary visual cortex. Edwards, G., Vizioli, L., & Muckli, L. VSS, St. Pete Beach, Florida, US. (2015).

Transfer of contextual information across saccades in V1. Edwards, G., Vizioli, L., & Muckli, L. T HBM 20th Annual Meeting. Hamburg, Germany. (2014).

Interhemispheric Transfer of Predictive Codes in V1 using fMRI. Edwards, G., Vetter, P., & Muckli, L. 3rd IMPRS NeuroCom Summer School, Leipzig, Germany. (2013)

Alpine Brain Imaging Meeting, Champéry, Switzerland. (2012); OHBM 18th Annual Meeting Abstract Supplement, page 107. Beijing, China. (2012)

Contextual information transfer across hemispheres in V1. Edwards, G., Okely, J., Smith, F.W., & Muckli, OHBM 19th Annual Meeting Abstract Supplement, page 183. Seattle, USA. (2013).

Spatiotemporal predictions along the apparent motion trace in V1 relate to feedback from V5 (shown by TMS) and update quickly after saccades. Muckli, L.F., Edwards, G., Alink, A., & Vetter, P. Society for Neuroscience. San Diego. (2010).

Transfer of visual predictions across hemispheres. Vetter, P., Edwards, G., & Muckli, L. Perception 39 ECVP Abstract Supplement, page 171. (2010).

TEACHING & ADVISING EXPERIENCE

Instructor, Department of Psychology, Harvard University, Cambridge MA (2018-2019)
Psychology & Neuroscience Sophomore Tutorial. 8 undergraduate students.
Responsibilities include designing the syllabus, leading class discussions, and grading all assignments.

Graduate Teaching Assistant (GTA), Psychology Department, University of Glasgow, Scotland (2010-14)
Psychology Laboratories. 30 students per class. Laboratory demonstrations & statistics advice.

Undergraduate Tutor, Psychology Department, University of Glasgow, Scotland (2011-14)
20 students/class. Teaching basic psychology, neuroscience, & statistics, fostering critical thinking, grading.

Advising
Supervised 5 postbacs, NIMH, NIH, Bethesda, MD (since 2020)
Mentored 4 research assistants, Harvard University, Cambridge MA (2017-2020)
Co-mentored 2 IIT@Harvard graduate students, Harvard University, Cambridge MA (2017-2020)
Co-mentored 3 dissertation students, Psychology Department, University of Glasgow, Scotland (2011-14)

AWARDS & GRANTS

Grants
Doctoral Training Grant, Medical, Veterinary, & Life Sciences, University of Glasgow, £14,553 per year.
Research Support - Moss Rehabilitation Research Institute, $4800.

Travel awards
Grindley grant, Experimental Psychology Society, 2013, £500.

Teaching/ supervising awards
NIMH Outstanding Mentor Award, NIH, 2021.
George W. Goethals Award – Recognizing excellence in teaching, Harvard University, 2019.

PROFESSIONAL SERVICE

Symposium Organizer
Organizers: Grace Edwards & Federica Contò. Title: Neuromodulation and cortical plasticity in the visual cortex: local and network-wide effects. ECVP (2018)

Ad-hoc review appointments
Attention Perception & Psychophysics, Brain Behavioral Research, Cognition, Cell Reports, European Journal of Neuroscience, Experimental Brain Research, Frontiers in Neuroscience, Journal of Neuroscience, Nature Scientific Reports, Nature Reviews Psychology, Brain Stimulation, Current Biology*, PLOS one*, Neuroimage*, Neuropsychologia** (*Collaborative Reviewer).

Professional memberships
Society for Neurosciences (2017-); Vision Sciences Society (2015-); Organization of Human Brain Mapping (2012-); Member of Centre of Cognitive Neuroimaging Glasgow (2011-).