Joshua J. Foster

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**Academic Appointments**

**Postdoctoral Associate**  2019–

Department of Psychological and Brain Sciences & Center for Systems Neuroscience

Boston University, Boston MA, USA

Adviser: Sam Ling

**Education**

**Ph.D. Psychology** 2019

The University of Chicago, Chicago IL, USA

Adviser: Edward Awh; Co-adviser: Edward Vogel

**M.S. Psychology**  2015

University of Oregon, Eugene OR, USA

Adviser: Edward Awh, Co-adviser: Edward Vogel

**M.Sc. Cognitive and Behavioural Neuroscience** 2013

Victoria University of Wellington, Wellington, New Zealand

Adviser: Gina Grimshaw

**B.Sc. Mathematics and Psychology** 2011

Victoria University of Wellington, Wellington, New Zealand

**Preprints**

**Foster JJ**, Thyer W, Wennberg JW, Awh E (2020). Covert attention increases the gain of stimulus-evoked population codes. *BioRxiv*. [Preprint](https://www.biorxiv.org/content/10.1101/2020.07.30.228981v2)

**Publications**

\* authors contributed equally to the work

**Foster JJ**, Vogel EK, Awh E (In Press). Working memory as persistent neural activity. In MJ Kahana & AD Wagner (Eds.), *Oxford Handbook of Human Memory.* Oxford University Press. [Preprint](https://psyarxiv.com/jh6e3/)

**Foster JJ**, Bsales EM, Awh E (2020). Covert spatial attention speeds target individuation. *Journal of Neuroscience,* 40(13), 2717-2726. [Article](https://www.jneurosci.org/content/40/13/2717.abstract) | [Data and Code](https://osf.io/a9mvb/)

Sutterer DW, **Foster JJ**, Serences JT, Vogel EK, Awh E (2019). Alpha-band oscillations track the retrieval of precise spatial representations from long-term memory. *Journal of Neurophysiology*, 122(2), 539-551. [Article](https://www.physiology.org/doi/full/10.1152/jn.00268.2019) | [Data and Code](https://osf.io/bh4dq/)

Sutterer DW\*, **Foster JJ\***, Adam KCS, Vogel EK, Awh E (2019). Item-specific delay activity demonstrates concurrent storage of multiple active neural representations in working memory. *PLOS Biology*, 17(4), e3000239. [Article](https://journals.plos.org/plosbiology/article?rev=2&id=10.1371/journal.pbio.3000239) | [Data and Code](https://osf.io/47cmn/)

**Foster JJ**, Awh E (2019). The role of alpha oscillations in spatial attention: limited evidence for a suppression account. *Current Opinion in Psychology*, 29, 34-40. [Article](https://www.sciencedirect.com/science/article/pii/S2352250X18301684)

van Moorselaar D, **Foster JJ**, Sutterer DW, Theeuwes J, Olivers CNL, Awh E (2018). Spatially selective alpha oscillations reveal moment-by-moment trade-offs between working memory and attention. *Journal of Cognitive Neuroscience*, 30(2), 256-266. [Article](https://www.mitpressjournals.org/doi/abs/10.1162/jocn_a_01198) | [Data and Code](https://osf.io/56rzh/)

Sprague TC, Adam KCS, **Foster JJ**, Rahmati M, Sutterer DW, Vo VA (2018). Inverted encoding models assay population-level stimulus representations, not single-unit neural tuning. *eNeuro*, 5(3), e0098-18.2018. [Article](https://www.eneuro.org/content/5/3/ENEURO.0098-18.2018)

**Foster JJ**, Bsales EM, Jaffe RJ, Awh E (2017). Alpha-band activity reveals spontaneous representations of spatial position in visual working memory. *Current Biology*, 27(20), 3216-3223. [Article](https://www.sciencedirect.com/science/article/pii/S096098221731196X) | [Data and Code](https://osf.io/vw4uc/) | [Research Highlight in Nature Reviews Neuroscience](https://www.nature.com/articles/nrn.2017.143?WT.ec_id=NRN-201712&spMailingID=55372847&spUserID=NzM5Njg0NjU0NzUS1&spJobID=1282840712&spReportId=MTI4Mjg0MDcxMgS2)

**Foster JJ**, Sutterer DW, Serences JT, Vogel EK, Awh E (2017). Alpha-band oscillations enable spatially and temporally resolved tracking of covert spatial attention. *Psychological Science*, 28(7), 929-941. [Article](https://journals.sagepub.com/doi/full/10.1177/0956797617699167) | [Data and Code](https://osf.io/29nxv/)

**Foster JJ**, Sutterer DW, Serences JT, Vogel EK, Awh E (2016). The topography of alpha-band activity tracks the content of spatial working memory. *Journal of Neurophysiology*, 115(1), 167-177. [Article](https://www.physiology.org/doi/full/10.1152/jn.00860.2015) | [Data and Code](https://osf.io/bwzfj/)

**Foster JJ\***, Adam KCS\* (2014). Is feature-based attention always spatially global during visual search? *Journal of Neuroscience*, 34(26), 8662-8664. [Article](https://www.jneurosci.org/content/34/26/8662.short)

Grimshaw GM, **Foster JJ**, Corballis PM (2014). Frontal and parietal EEG asymmetries interact to predict attentional biases to threat. *Brain & Cognition*, 90, 76-86. [Article](https://www.sciencedirect.com/science/article/pii/S0278262614001055)

**Manuscripts in Preparation**

Ramirez LD, **Foster JJ**, Ling S (In Prep). Temporal attention selectively enhances gain for target features.

Vo VA, Sutterer DW, **Foster JJ**, Sprague TC, Awh E, Serences JT (In Prep). Long-term and short-term memory representations in retinotopic visual cortex: cortical reinstatement and source information.

**Conference Proceedings: Talks**

Ramirez LD, **Foster JJ**, Ling S (2020). Temporal attention selectively enhances gain only for target features. Vision Sciences Society Annual Meeting, held online.

**Foster JJ**, Bsales EM, Awh E (2018). The N2pc does not reflect a shift of covert spatial attention. Vision Sciences Society Annual Meeting, St. Pete Beach, FL, USA.

Vo VA, Sutterer DW, Foster JJ, Sprague TC, Serences JT, Awh E (2017). Neural representations of spatial position recalled from long-term and short-term memory diverge across the cortical hierarchy. Vision Sciences Society Annual Meeting, St. Pete Beach, FL, USA.

Awh E, **Foster JJ**, Serences JT, Vogel EK (2015). Time-resolved tracking of covert spatial attention using rhythmic brain activity. The Psychonomic Society Annual Meeting, Chicago, IL, USA.

**Foster JJ**, Serences JT, Vogel EK, Awh E (2015). EEG alpha rhythms track the deployment of spatial attention. Vision Sciences Society Annual Meeting, St. Pete Beach, FL, USA.

**Foster JJ**, Awh E (2014). Distinguishing between true guessing and low-precision representations in visual working memory. Cognitive Science Association for Interdisciplinary Learning Annual Meeting, Hood River, OR, USA.

**Foster JJ**, Corballis PM, Hunkin LM, Grimshaw GM (2012). Relating EEG asymmetries to emotional biases in attention. Kiwi Cognition and Memory Annual Meeting, Wellington, New Zealand.

**Conference Proceedings: Recent Poster Presentations**

Full list available upon request.

**Foster JJ**, Awh E (2019, May). Characterizing the influence of spatial attention on stimulus-evoked cortical representations. Vision Sciences Society Annual Meeting, St. Pete Beach, FL, USA.

**Foster JJ**, Bsales EM, Awh E (2018, November). Covert spatial attention speeds target individuation. Society for Neuroscience Annual Meeting, San Diego, CA, USA.

**Foster JJ\***, Sutterer DW\*, Adam KCS, Vogel EK, Awh E (2017, November). Alpha-band activity reveals concurrent storage of independent locations in spatial working memory. Society for Neuroscience Annual Meeting, Washington, DC, USA.

**Invited Talks**

Covert spatial attention speeds target individuation. Visual Attention Lab (directed by Dr. Jeremy Wolfe), Harvard Medical School & Brigham and Women’s Hospital, December 2019.

Oscillatory alpha-band activity tracks spatial selective attention and spatial working memory. Vision Division Brownbag, Department of Psychology, University of Illinois at Urbana-Champaign, November 2015.

**Awards and Fellowships**

Boston University Center for Systems Neuroscience Post-Doctoral Fellowship 2019–

Social Sciences Fellowship, University of Chicago 2015–2019

Graduate Research Fellowship, University of Oregon 2013–2015

Fulbright Science and Innovation Graduate Award 2013

Freemasons Postgraduate Scholarship 2012

Victoria University of Wellington Master’s (by thesis) Scholarship 2012

Victoria University of Wellington Graduate Award 2011

Victoria University of Wellington Summer Research Scholarship 2010

Freemasons University Scholarship 2010

Studylink Bonded Merit Scholarship 2009

**Research Mentorship**

\* mentee has co-authored peer-reviewed paper

Amelia Harrison (Boston University, Master’s student) 2020–

Julia Schwartz (Boston University, undergraduate student) 2019–2020

Naomi Nero (University of Chicago, undergraduate student) 2018–2019

Mei Arditi (University of Chicago, undergraduate student) 2018­–2019

Janna Wennberg\* (University of Chicago, visiting student from Carleton College) 2018

Russell Jaffe\* (University of Chicago, visiting student from Oberlin College) 2017

Emma Bsales\* (University of Chicago, undergraduate student) 2015­–2018

Jared Evans (University of Oregon, undergraduate student) 2014 -2015

Camille Nawawi (University of Oregon, undergraduate student) 2014–2015

Karma Sawyer (University of Oregon, undergraduate student) 2013–2014

**Teaching Experience**

Teaching Assistant, Attention and Working Memory in the Mind and Brain, 2019

The University of Chicago

Teaching Assistant, Cognitive Psychology, The University of Chicago 2018

Teaching Assistant, Sensation and Perception, The University of Chicago 2016

Teaching Assistant, Cognitive Development, The University of Chicago 2016

Tutor, Behaviour Analysis, Victoria University of Wellington 2013

Tutor, Research Methods, Victoria University of Wellington 2013

Tutor, Cognitive Psychology, Victoria University of Wellington 2012–2013

**Professional Memberships**

Society for Neuroscience

Vision Sciences Society

**Ad-Hoc Reviewing**

*Cortex*

*Current Biology*

*Journal of Cognitive Neuroscience*

*Journal of Experimental Psychology: General*

*Journal of Experimental Psychology: Learning, Memory, and Cognition*

*Journal of Neuroscience*

*NeuroImage*

*Neuropsychologia*

*Psychological Science*

*Psychophysiology*

*Scientific Reports*

**Service**

Chair, Institute for Mind and Biology Fellow’s Committee, The University of Chicago 2016-2018

Mentor, Te Rōpū Āwhina, Victoria University of Wellington 2010-2011

Secretary, Victoria Students’ Psychology Society, Victoria University of Wellington 2010