

# 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

## Publications

\* authors contributed equally to the work

**Foster JJ**, Ling S (2021). Normalizing population receptive fields. *Proceedings of the National Academy of Sciences*, 118(47), e2118367118. Invited commentary on Aqil et al. (2021) PNAS. [Article](#)

**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](#)

Vo VA, Sutterer DW, **Foster JJ**, Sprague TC, Awh E, Serences JT (2021). Shared representational formats for information maintained in working memory and information retrieved from long-term memory. *Cerebral Cortex*. [Article](#) | [Data and Code](#)

Ramirez LD, **Foster JJ**, Ling S (2021). Temporal attention selectively enhances target features. *Journal of Vision*, 21(6):6, 1-12. [Article](#)

**Foster JJ**, Thyer W, Wennberg JW, Awh E (2021). Covert attention increases the gain of stimulus-evoked population codes. *Journal of Neuroscience*, 41(8), 1802-1815. [Article](#) | [Data and Code](#)

**Foster JJ**, Bsales EM, Awh E (2020). Covert spatial attention speeds target individuation. *Journal of Neuroscience*, 40(13), 2717-2726. [Article](#) | [Data and Code](#)

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](#) | [Data and Code](#)

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](#) | [Data and Code](#)

**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](#)

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](#) | [Data and Code](#)

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](#)

**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](#) | [Data and Code](#) | [Research Highlight in Nature Reviews Neuroscience](#)

**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](#) | [Data and Code](#)

**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](#) | [Data and Code](#)

**Foster JJ\***, Adam KCS\* (2014). Is feature-based attention always spatially global during visual search? *Journal of Neuroscience*, 34(26), 8662-8664. [Article](#)

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](#)

## Preprints

Harrison AH, Ling S, **Foster JJ** (2021). Divided attention impairs detection of simple visual features. *OSF Preprints*. [Article](#)

## 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**

Spatial attention improves population codes and speeds object individuation Department of Psychology Colloquium Series, Vrije Universiteit, Amsterdam, the Netherlands, Talk given online, January 15 2021.

Covert spatial attention speeds target individuation. Visual Attention Lab (directed by Dr. Jeremy Wolfe), Harvard Medical School & Brigham and Women's Hospital, December 17 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 4 2015.

## Awards and Fellowships

Boston University Center for Systems Neuroscience Post-Doctoral Fellowship	2019–
Social Sciences Fellowship, The 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

Jonathan Hendry (Boston University, undergraduate student)	2021–
Amelia Harrison (Boston University, Master’s student)	2020–2021
Julia Schwartz (Boston University, undergraduate student)	2019–2020
Naomi Nero (The University of Chicago, undergraduate student)	2018–2019
Mei Arditi (The University of Chicago, undergraduate student)	2018–2019
Janna Wennberg* (The University of Chicago, visiting student from Carleton College)	2018
Russell Jaffe* (The University of Chicago, visiting student from Oberlin College)	2017
Emma Bsales* (The 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, The University of Chicago	2019
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

*Attention, Perception, & Psychophysics*

*Cortex*

*Current Biology*

*Journal of Cognitive Neuroscience*

*Journal of Experimental Psychology: General*

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

*Journal of Neuroscience*

*Nature Communications*

*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