Curriculum Vita

Edward S. Awh

Department of Psychology
Institute for Mind and Biology
University of Chicago
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updated July 2017

Education:
University of Michigan, Ph.D. in Psychology, 1996.
University of Michigan, M.A. in Psychology, 1992.
Northwestern University, B.A. in Psychology, 1989.

Professional Experience:
July 2015 to present
Professor, Department of Psychology and Institute for Mind and Biology, University of Chicago.
September 2008 to June 2015
Professor, Department of Psychology and Institute of Neuroscience, University of Oregon.
September 2004 to September 2008
Associate professor, Department of Psychology, University of Oregon.
January 1999 to September 2004
Assistant professor, Department of Psychology, University of Oregon.
November 1996 to 1998:
Postdoctoral fellow at the Center for Human Information Processing, Department of Psychology, University of California San Diego.
1990 to 1996:
Research Assistant for Dr. John Jonides, and Dr. Edward E. Smith, Department of Psychology, University of Michigan, Ann Arbor.
1989 to 1990:
Senior Research Technician at the Franklin McClean Positron Emission Tomography Research Center, University of Chicago.

Awards and Honors
Elected Fellow, Society of Experimental Psychologists 2013
Elected Fellow, Association for Psychological Science 2012
Posner-Bois Fellow, University of Oregon Department of Psychology 2004
Departmental Associate, University of Michigan Department of Psychology 1995-96
Rackham Dissertation Fellowship, University of Michigan, 1995.
Rackham Graduate Fellowship, University of Michigan, 1990-1994.
Graduated with honors, Northwestern University Department of Psychology, 1989.
Benton J. Underwood Research Fellowship, Northwestern Department of Psychology, 1988.
National Merit Scholarship, Northwestern University 1985-1989.

Grant Support
R01 National Institutes of Mental Health, 2001-2005
"Neural and Behavioral Mechanisms of Distractor Exclusion"
Total direct costs: $450,000
Principal Investigator: Edward Awh

Oregon Medical Research Foundation, 2006-2007
"Diagnostic Tools for ADHD"
Total direct costs: $30,000
Role: Principal Investigator

R01 National Institutes of Mental Health, 2007-2012
Impaired Resolution of Visual Interference as an Endophenotype for ADHD
Total direct costs, $1,125,000
Role: Principal Investigator

R01 National Institutes of Mental Health, 2009-2014
"On the Distinction between Number and Resolution in Visual Working Memory"
Total direct costs: $2,019,966
Role: Principal Investigator

Supplement to R01 from National Institutes of Mental Health, 2009-2010
"On the Distinction between Number and Resolution in Visual Working Memory"
Total direct costs: $149,493
Role: Principal Investigator

R01 National Institutes of Health,
"Oscillatory measures of number and precision in working memory"
Total direct costs: $3,081,988
Role: Principal Investigator

Peer Reviewed Publications (total citations (Google Scholar: 10,200; H-index: 38)
(in chronological order: *papers co-authored with advisees, **§**Awh is corresponding/senior author)

1. Jonides, J., Smith, E. E., Koeppe R.A., Awh, E. S., Minoshima, S., and Mintun, M.A. (1993). Spatial working memory in humans as revealed by PET. *Nature, 363*, 623-625.

2. Minoshima, S., Koeppe, R.A., Smith, E.E., Awh, E., & Jonides, J. PET investigations of working memory. *Experimental Medicine*, 1994, 12, 70-72.

3. Smith, E.E., Jonides, J., Koeppe, R.A., Awh, E., Schumacher, E.H. and Minoshima, S. (1995). Spatial vs. Object working memory: PET investigations. *Journal of Cognitive Neuroscience*., *7*, 337-356.

4. Awh, E., Jonides, J., Smith, E.E., Schumacher, E.H., Koeppe, R.A., Katz, S. (1996). Dissociation of storage and rehearsal in verbal working memory: evidence from PET. *Psychological Science, 7*(1), 25-31.

5. Schumacher, E.H., Lauber, E.J., Awh, E., Jonides, J., Smith, E.E., Koeppe, R.A. (1996). PET evidence for an amodal verbal working memory system. *Neuroimage, 3*(2), 79-88.

6. Jonides, J., Schumacher, E. H., Smith, E. E., Lauber, E., Awh, E., Minoshima, S., & Koeppe, R. A. (1997). The task-load of verbal working memory affects regional brain activation as measured by PET. *Journal of Cognitive Neuroscience*, *9(4), 462-475.*

7. Jonides, J., Schumacher, E.H., Smith, E.E., Koeppe, R.A., Awh, E., Reuter-Lorenz, P.A., Marshuetz, C., & Willis, C.R. (1998). The role of parietal cortex in verbal working memory. *The Journal of Neuroscience, 18* (13):5026-5034.

8. Awh, E., Jonides, J., & Reuter-Lorenz, P.A. (1998). Rehearsal in Spatial Working Memory. *Journal of Experimental Psychology: Human Perception and Performance. 24(3)*, 780-790.

9. Awh, E., Jonides, J., Smith, E.E., Buxton, R.B., Frank, L.R., Love, T., Wong, E.C., & Gmeindl, L. (1999). Rehearsal in spatial working memory: Evidence from neuroimaging. *Psychological Science, 10*(5), 443-437.

10. Awh, E. & Pashler, H. (2000). Evidence for split attentional foci. *Journal of Experimental Psychology: Human Perception and Performance, 26*(2), 834-846.

11. Awh, E., Anllo-Vento, & Hillyard, S.A. (2000). The role of spatial selective attention in working memory for locations: evidence from event-related potentials. *Journal of Cognitive Neuroscience, 12*(5), 840-847.

12. *§Awh, E., Dhaliwal, H., Christensen, S., Matsukura, M. (2001). Evidence for two components of object-based selection. *Psychological Science, 12*(4), 329-334.

13. Awh, E., & Jonides, J. (2001). Overlapping mechanisms of attention and working memory. *Trends in Cognitive Sciences,5*(3), 119-126.

14. *Awh, E., Matsukura, M., Serences, J. (2003). Top-down control over biased competition during covert orienting. *Journal of Experimental Psychology: Human Perception and Performance, 29*(1), 52-63.

15. *Mayr, U., Awh, E., & Laurey, P. (2003). Conflict adaptation effects in the absence of executive control. *Nature Neuroscience, 6*(5), 450-452.

16. *Awh E., Serences, J., Laurey, P., Dhaliwal, H., van der Jagt, T., & Dassonville, P. (2004). Evidence against a central bottleneck during the attentional blink: multiple channels for configural and featural processing. *Cognitive Psychology, 48*, 95-126.

17. Postle, B.R., Awh, E., Jonides, J., Smith, E.E., D'Esposito, M. (2004). The where and how of attention-based rehearsal in spatial working memory. *Cognitive Brain Research, 20*, 194-205.

18. *Serences, J., Yantis, S., Culberson, A. & Awh, E. (2004). Preparatory activity in visual cortex indexes distractor suppression during covert spatial orienting. *Journal of Neurophysiology, 92*, 3538-3545.

19. *Awh, E., Sgarlata, A.M., Kliestik, J. (2005). Resolving visual interference during covert spatial orienting: Online Attentional Control Through Static Records of Prior Visual Experience. *Journal of Experimental Psychology: General, 134*(2), 192-206.

20. Awh, E., Vogel, E., & Oh, S.-H. (2006). Interactions between attention and working memory. *Neuroscience, 139*, 201-208.

21. Awh, E., Armstrong, K.M. & Moore, T. (2006). Visual and oculomotor selection: links, causes and implications for spatial attention. *Trends in Cognitive Sciences, 10*(3), 124-130.

22. *§Scolari, M., Kohnen, A. Barton, B., & Awh, E. (2007). Spatial attention, preview, and popout: Which factors influence critical spacing in crowded displays? *Journal of Vision, 7*(2):7, 1-23.

23. **§Awh, E., Barton, B., Vogel, E.K. (2007). Visual working memory represents a fixed number of items, regardless of complexity. *Psychological Science, 18*(7), 622-628.

24. *§Ester, E. & Awh E. (2008). The locus of interference from salient singleton distractors. *Visual Cognition, 16*(2/3), 166-181.

25. *§Scolari, M., Vogel, E.,& Awh, E. (2008). Perceptual expertise enhances the resolution but not the number of representations in working memory. *Psychonomic Bulletin and Review, 15*(1), 215-222.

26. Mednick, S.C., Drummond, S.P., Boynton, G.M., Awh, E., Serences, J. (2008). Sleep-dependent learning and practice-dependent deterioration in an orientation discrimination task. *Behavioral Neuroscience, 122*(2), 267-72.

27. Vogel, E. K. & Awh, E. (2008). How to exploit diversity for scientific gain: Using individual differences to constrain cognitive theory. *Current Directions in Psychological Science, 17*(2), 171-176.

28. §Serences, J., Scolari, M., & Awh, E. (2008). On-line response-selection and the attentional blink: multiple-processing channels. *Visual Cognition.*

29. Mayr, U., & Awh, E. (2008). The elusive link between conflict and conflict adaptation. *Psychological Research, 73,* 794-802.

30. *§Serences, J., Ester, E., Vogel, E.K., & Awh, E. (2009). Stimulus-specific delay activity in human primary visual cortex. *Psychological Science, 20*(2), 207-214.

31. *§Barton, B., Ester, E., & Awh, E. (2009). Discrete resource allocation in visual working memory. *Journal of Experimental Psychology: Human Perception and Performance, 35*(5), 1359-1367.

32. *§Williamson-Worden, K.; Scolari, M, Jeong, S., Kim, M., Awh, E. (2009). Experience-dependent changes in the topography of visual crowding. *Journal of Vision*, *9*(11), 1-9.

33. *§Ester, E.F., Serences, J.T., & Awh, E. (2009). Spatially global representations in human primary visual cortex during working memory maintenance. *Journal of Neuroscience, 29*(48), 15258-15265.

34. Fukuda, K., Awh, E., Vogel, E.K. (2010). Discrete capacity limits in visual working memory. *Current Opinion in Neurobiology.*

35. *§Umemoto, A., Drew, T., Ester, E.& Awh, E. (2010). A bilateral advantage for storage in visual working memory. *Cognition 117,* 69-79.

36. §Fukuda, K., Vogel, E.K., Mayr, U., & Awh, E. (2010). Quantity not quality: The relationship between fluid intelligence and working memory capacity. *Psychonomic Bulletin and Review, 17*(5), 673-679.

37. *§Umemoto, A., Scolari, M., Vogel, E.K., & Awh, E. (2010). Statistical learning induces discrete shifts in the allocation of working memory resources. *Journal of Experimental Psychology: Human Perception and Performance.*

38. *Stevens, A.A., Maron, L., Nigg, J.T., Cheung, D., Ester, E.F., & Awh, E. (2012). Increased sensitivity to perceptual interference in adults with attention deficit hyperactivity disorder. *Journal of the International Neuropsychological Society, 18,* 1-10.

39. *§Ester, E.F., Drew, T.W., Klee, D., Vogel, E.K. & Awh, E. (2012). Neural measures reveal a fixed item limit in subitizing. *Journal of Neuroscience,32*(21), 7169-7177.

40. Awh, E., Belopolsky, A.V., & Theeuwes, J. (2012). Top-down versus bottom-up attentional control: A failed theoretical dichotomy. *Trends in Cognitive Sciences, 16*(8), 437-443.

41. Van der Burg, E., Awh, E., & Olivers, C.N.L. (2013). The capacity of audiovisual integration is limited to one. *Psychological Science, 24*(3), 345-351.

42. *§Ester, E.F., Anderson, D.E., Serences, J.T., & Awh, E. (2013). A neural measure of precision in visual working memory. *Journal of Cognitive Neuroscience, 25*(5), 754-761.

43. Postle, B.R., Awh, E., Serences, J.T., Sutterer, D.W. & D'Esposito, M. (2013). The positional specificity effect reveals a passive-trace contribution to visual short-term memory. *PLOS one.*

44. *§Ester, E.F., Klee, D., Awh, E. (2013). Visual crowding cannot be wholly explained by pooling. *Journal of Experimental Psychology: Human Perception and Performance.*

45. *§Ester, E.F., Fukuda, K., May, L.M. & Vogel, E.K., Awh, E. (2014). Evidence for a fixed capacity limit in attending multiple locations. *Cognitive Affective and Behavioral Neuroscience.*

46. Van den Berg, R., Awh, E. & Ma WJ (2014). Conceptualizing and testing working memory models in a three-dimensional model space. *Psychological Review.*

47. Unsworth, N., Fukuda, J., Awh, E., & Vogel, E.K. (2014). Working memory and fluid intelligence: Capacity, attentional control, and secondary memory retrieval. *Cognitive Psychology.*

48. Unsworth, N., Fukuda, K., Awh., E. & Vogel, E.K. (2014). Working memory delay activity predicts individual differences in cognitive abilities. *Journal of Cognitive Neuroscience.*

49. *§Sutterer, D.W. & Awh, E. (2015). Retrieval practice enhances the accessibility but not the quality of memory. *Psychonomic Bulletin and Review*.

50. Belopolsky, A.V. & Awh, E. (2016). The role of context in volitional control of feature-based attention. *Journal of Experimental Psychology: Human Perception and Performance.*

51. *§Foster, J.J., Sutterer, D.W., Serences, J.T., Vogel, E.K. & Awh, E (2016). The topography of alpha-band activity tracks the content of spatial working memory. *Journal of Neurophysiology.*

52. Luria, R., Balaban, H., Awh, E. & Vogel, E.K. (2016). The contralateral delay activity as a neural measure of visual working memory. *Neuroscience and Biobehavioral Reviews*.

53. *§Ester, E., Sutterer, D.W., Serences, J.T., & Awh, E. (2016). Feature-selective attentional modulations in human frontoparietal cortex. *Journal of Neuroscience*.

54. Olivers, C.N.L., Awh, E., & Van der Burg, E. (2016). The capacity to detect synchronous audiovisual events is severely limited: Evidence from mixture modelling. *Journal of Experimental Psychology: Human Perception and Performance.*

55. Oberauer, K., Awh, E., & Sutterer, D.W. (2017). The role of long-term memory in a test of visual working memory: Proactive facilitation but no proactive interference. *Journal of Experimental Psychology: Learning, Memory, and Cognition.*

56. *§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.*

57. *§Adam, K.C.S., Vogel, E.K., & Awh, E. (2017). Clear evidence for item limits in visual working memory. *Cognitive Psychology.*

Invited reviews, commentaries, book chapters, edited volumes

1. Awh, E., Smith, E.E., Jonides, J. (1995). Human rehearsal processes and the frontal lobes: PET evidence. In J. Grafman, K. Holyoak, & F. Boller (Eds.) *Structure and functions of the human prefrontal cortex Annals of the New York Academy of Sciences., vol. 769*, 97-119 New York, NY:, New York Academy of Sciences.

2. Jonides, J., Reuter-Lorenz, P.A., Smith, E.E., Awh, E., Barnes, L.L., Drain, M., Glass, J., Lauber, E., Patalano, A., Schumacher,E.H. (1996). Verbal and Spatial Working Memory in Humans. *The Psychology of Learning and Motivation*.,*4,* Medin, D. (ed.). Academic Press.

3. Awh, E., & Jonides, J. (1998) Spatial Selective Attention and Spatial Working Memory. *The Attentive Brain.* Parasuraman, R. (Ed.), pp. 353-380, Cambridge, Mass: M.I.T. Press.

4. Awh, E. & Gehring, W.J. (1999). The anterior cingulate lends a hand in response selection. *Nature Neuroscience, 2*(10), 853-854.

5. Jonides, J., Sylvester, C-Y.C., Lacey, S.C., Wager, T.D., Nichols, T.E., and Awh E. (2002). Modules of working memory. In R.H. Kluwe, G. Luer, and F. Rosler (Eds.). *Principles of Working Memory*. Boston: Birkhaeuser Publishing Ltd.

6. Jonides, J. & Awh, E. (2003). What Is The Source Of Activation For Working Memory? *Behavioral and Brain Sciences, 26 (*6), 741 – 742.

7. Mayr, U., Awh, E. & Keele, S.W. (eds.) (2005). Developing Individuality in the Human Brain: A Tribute to Michael I. Posner. Washington, DC: American Psychological Association.

8. §Stevens, C., & Awh, E. (2007). Commentary: Specificity, mechanisms, and timing in the study of spatial cognition. *The Emerging Spatial Mind.* J. Plumert & J.P. Spencer (Eds). Oxford University Press.

9. Awh, E., & Vogel, E. (2008). The bouncer in the brain. *Nature Neuroscience, 11*(1), 5-6.

10. *§Ester, E., Vogel, E.K., & Awh, E. (2012). Discrete resource limits in attention and working memory. *Cognitive Neuroscience of Attention*. M.I. Posner (Ed). Guilford Press.

11. Awh, E., & Vogel, E.., (2015). Attention: Feedback focuses a wandering mind. *Nature Neuroscience, 18*, 327-328.

Colloquia

Bielefeld University
Dartmouth University
Duke University
Georgia Institute of Technology
Indiana University
Johns Hopkins University
Massachusetts Institute of Technology
Max Planck Institute, Leipzig
Michigan State University
Middlesex University
National Chung Cheng University
North Dakota State University
Northwestern University
Oregon Health Sciences University
Purdue University
Radboud University
Ruhr University Bochum
Saarland University
UC Berkeley
UC Irvine
UC San Diego
University of Copenhagen
University of Denver
University of Groningen
University of Illinois
University of Massachusetts Medical School
University of Michigan
University of Missouri
University of Nevada, Reno
University of North Carolina at Greensboro
University of Oregon
University of Toronto
University of Trento
University of Washington

University of Wisconsin-Milwaukee
University of Zurich
Vanderbilt University
Vrije University, Amstderdam
Washington University in St. Louis
Yale University
Yonsei University

Editorial Positions

2006 to 2009 Consulting Editor for *Journal of Experimental Psychology: Learning Memory and Cognition.*
2009 to 2012, Consulting Editor for *Memory and Cognition.*
2009 to January 2012, Member Editorial Board for *Psychological Science.*
2010-2013, Associate Editor for *Psychological Bulletin and Review*
2012 to present, Associate Editor for *Psychological Science*

Administrative Experience

University of Michigan Psychology Department Executive Committee, Fall 1995-Fall 1996.
University of Michigan Cognition and Perception admissions committee, 1992.
Co-chair of Colloquium Committee for the University of Oregon Psychology Colloquium Series
Elected Member of Psychology Department Executive Committee, University of Oregon, 2002-2004; 2005-2007; 2012-2014.
Member of Lewis Imaging Center Executive Committee, 2001-2003.
University of Oregon Institutional Review Board, Member 2006, 2007
University of Oregon Institutional Review Board, Vice Chair 2008-2009
Chair of Graduate Education Committee, University of Oregon. Spring 2006-2009.
Member, Psychonomic Society Governing Board 2015-2021.
Chair of Program Committee, Psychonomics Society 2017.

Ad hoc reviewer

Acta Psychologia
Attention Perception and Psychophysics
Behavioral Brain Research
Behavioral Neuroscience
Brain
British Journal of Psychology
Cerebral Cortex
Cognition
Cognitive Affective and Behavioral Neuroscience
Cognitive Brain Research
Cognitive Psychology
Developmental Psychology
European Journal of Neuroscience
European Journal of Cognitive Psychology
Frontiers in Neuroscience
Frontiers in Cognitive Science
Human Brain Mapping
Journal of Cognitive Neuroscience
Journal of Experimental Psychology: General
Journal of Experimental Psychology: Human Perception and Performance

Journal of Experimental Psychology: Learning, Memory and Cognition
Journal of Neurophysiology
Journal of Neuroscience
Journal of Vision
Memory
Memory and Cognition
Nature
Nature Neuroscience
Neuroimage
Neuron
Neuropsychologia
Perception and Psychophysics
Personality and Social Psychology Bulletin
PLOS one
Proceedings of the National Academy of Sciences
Psychobiology
Psychological Bulletin
Psychological Bulletin and Review
Psychological Review
Psychological Science
Psychophysiology
Quarterly Journal of Experimental Psychology
Trends in Cognitive Sciences
Visual Cognition
Vision Research

Grant reviews:

Alzheimer's Research Partnership of Oregon
National Institutes of Health – Member, Cognition and Perception Study Section – Oct 2007-Jun 2012
National Science Foundation

Professional Memberships

Society of Experimental Psychologists
Association for Psychological Science
Psychonomics Society
Vision Science Society
Cognitive Neuroscience Society