

Kristina M. Visscher

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EDUCATION AND CURRENT POSITION

Postdoctoral Researcher, Brandeis University, Waltham, MA (2004-present)

Topics: Psychophysical and computational modeling comparison of memories for vision and sound. Attention's effects on visual memory studied using electroencephalography (EEG). Postdoctoral advisor: Dr. Robert Sekuler.

Ph.D., Neuroscience, Washington University, St. Louis, MO (2004)

Thesis: Exploring task-level control: functional MRI of sustained neural activity.
Thesis advisor: Dr. Steven E. Petersen

B.A., Physics, Cum Laude, Carleton College, Northfield, MN (1998)

Senior Thesis: The physics of the brain: action potential propagation and electric fields.

AWARDS

NIH Training Fellow, Neurobiology: Genes, Channels and Behavior
Brandeis University. (2004-2006)

Selected for and attended Neuroinformatics Summer School
Woods Hole Marine Biological Laboratory. (2006)

Spencer T. and Ann W. Olin Fellow for Excellence in Biomedical Research
Washington University. (2004)

O'Leary Prize for Outstanding Research in Neuroscience, Finalist
Washington University. (2004)

Selected for and attended Complex Systems Summer School
Santa Fe Institute for Complex Systems. (2003)

NIH Systems Training Grant Fellow
Washington University. (1999-2002)

National Science Foundation Research Experience for Undergraduates Fellow
University of Oregon. (1997)

National Science Foundation Research Experience for Undergraduates Fellow
University of Alabama. (1996)

INVITED TALKS

Rhodes College (January, 2007)
Wellesley College (December, 2007)
University of Michigan (January, 2008)
Smith College (February, 2008)
University of Alabama, Birmingham (April, 2008)

RESEARCH EXPERIENCE

Psychophysics, Computational Models of Memory, and EEG

Psychophysical comparison of memory for sounds and visual images using well-matched stimuli.
Effects of ignoring and attention on memory and EEG.
Brandeis University, with Dr. Robert Sekuler. (2004-present)

Functional Magnetic Resonance Imaging

Exploring task-level control: Functional MRI of sustained neural activity.
Washington University, with Dr. Steven E. Petersen.
Thesis committee: Dr. Lawrence Snyder, Dr. Marcus Raichle, Dr. Randy Buckner, and Dr. Gordon Shulman. (2000-2004)

Functional magnetic resonance imaging of language processing in children and comparison with adults.
Washington University, with Dr. Steven E. Petersen and Dr. Bradley L. Schlaggar. (1999-2000)

Electrophysiology

Role of the parietal cortex in the processing of visual spatial information.
With Dr. Lawrence Snyder. (2000)

Electrophysiology of the vestibular system.
Washington University, with Dr. Dora Angelaki. (2000)

Computational Modeling

Computer modeling of arrays of retinal ganglion cells.
Washington University, with Dr. David Van Essen and Dr. Charles Anderson. (1999)

Physics and Chemistry

Computer modeling of polymer motion through a small pore, applications to electrophoresis.
University of Oregon, with Dr. Jeff Cina, Chemical Physics Institute. (1997)

Electrochemistry of dopamine.
University of Alabama, with Dr. Yeong-Taik Kim, Chemistry Department. (1996)

Computer modeling of small molecules.
University of Alabama, with Dr. David Nikles, Chemistry Department. (1995)

TEACHING EXPERIENCE

- Head Instructor **Brandeis University.** (2005)
Behavioral Neuroscience.
- Colloquium Advisor **Brandeis University.** (2006)
Autism and Human Developmental Disorders.
- Team Head **Washington University** Neuroscience Teaching Team. (2000-2004)
Organized outings to St. Louis schools.
Interactive demonstrations to teach kids about the brain.
- Guest Lecturer **Brandeis University.** (2005)
Lectures on functional neuroimaging for the Cognitive Neuroscience course.
- Teaching Assistant **Washington University.** (2000)
Cellular and Molecular Neuroscience.
- Carleton College.** (1996-1998)
Introduction to Physics with and without Calculus.
Physics of Instrumentation (pre-med).
Revolutions in Physics.
Atomic and Nuclear Physics.
- Teacher **Science Museum of Minnesota,** St. Paul, MN. (1998)
Lewis and Clark Summer School, St. Louis, MO. (1999)
Science outreach classes of my own design including Chemistry,
“Incredible Inflatable Structures” and “How to take apart a VCR.”

INFORMAL SCIENCE EDUCATION

- Museum Interpreter **St. Louis Science Center.** (2004)
Helped design hands-on visitor activities.
Gave interactive demonstrations at the exhibit “The Brain.”
- City Museum,** St. Louis, MO. (1999-2002)
Created projects for visitors to this innovative hands-on museum.
Helped run the museum on occasional weekends.
- Volunteer Brain Awareness Week and International Brain Bee, Boston, MA.
(2005-present)
- Outreach Created short Physics documentary for Discover Magazine competition.
(2007)

SERVICE AND MENTORSHIP

- Mentor Direct supervisor to graduate, undergraduate and advanced high school students. Each student performed original research and gave presentations about it. (2001-present)
- Board Member Young Scientist Program. YSP is an umbrella organization of many graduate student-run science outreach organizations at Washington University. The

board organizes them and distributes funds. (2000-2004)
Referee For the journals Cerebral Cortex, NeuroImage and Brain Research.

PROFESSIONAL MEMBERSHIPS

Cognitive Neuroscience Society
Society for Neuroscience

PUBLICATIONS

- Visscher, K.M.**, Kaplan, E., Kahana, M.J., Sekuler, R. (2007). Auditory short-term memory behaves like visual short-term memory. *PLoS Biology* 5(3). [link to paper, news article](#)
- Visscher, K.M.**, Kahana, M.J., Sekuler, R. (2008). Proactive interference in auditory memory: Effects of stimulus information and meta-information *Submitted*. [link](#)
- Palmer, E.D., **Visscher, K.M.**, Kang, H.C., Burgund, E.D., Buckner, R.L., Petersen, S.E. (2008). Defining task-block-related signals using fMRI: I. Structure of a task-level control system. *Submitted*.
- Visscher, K.M.**, Palmer, E.D., Kang, H.C., Burgund, E.D., Buckner, R.L., Petersen, S.E. (2008). Defining task-block-related signals using fMRI: II. Implementing task-level control. *Submitted*.
- Dosenbach, N.U.F., **Visscher, K.M.**, Palmer, E.D., Miezin, F.M., Wenger, K.K., Kang, H.C., Burgund, E.D., Grimes, A.L., Schlaggar, B.L., Petersen, S.E. (2006). A core system for the implementation of task sets. *Neuron*, 50(5):799-812. [link](#)
- Weissman, D.H., Roberts, K.C., **Visscher, K.M.**, Woldorff, M.G. (2006). Zoning out: The neural bases of momentary lapses in attention. *Nature Neuroscience*, 9(7): 971-8. [link](#)
- Wenger, K.K, **Visscher, K.M.**, Miezin, F.M., Petersen, S.E., Schlaggar, B.L. (2004). Comparison of sustained and transient activity in children and adults using a mixed blocked/event-related fMRI design. *NeuroImage*, 22(2): 975-85. [link](#)
- Visscher, K.M.**, Miezin, F. M., Kelly, J., Buckner, R.L., Donaldson, D.I., McAvoy, M., Bhalodia, V., Petersen, S. E. (2003). Mixed blocked/event-related designs can correctly separate transient and sustained activity in fMRI. *NeuroImage*, 19: 1694-708. [link](#)
- Visscher, K.M.**, Viets, E., Snyder, L. (2003). Effects of training on memory-guided saccade performance. *Vision Research*, 43: 2061-71. [link](#)
- Schlaggar, B. L., Brown, T.T., Lugar, H.M., **Visscher, K.M.**, Miezin, F.M., Petersen, S.E. (2002). Functional neuroanatomical differences between adults and children in the processing of single words. *Science* 296, 1476-1479. [link](#)

ABSTRACTS

- Visscher, K.M.**, Sekuler, R. (2008). Pre-stimulus neural activity predicts success in ignoring. *Computational and Systems Neuroscience Conference Abstracts*. [link](#)
- Visscher, K.M.**, Sekuler, R. (2007). EEG correlates of intentional ignoring. *Society for Neuroscience Abstracts*. [link](#)

Visscher, K.M., Kaplan, E., Kahana, M.J., Sekuler, R. (2006). Visual and auditory short-term memory are highly similar when examined with comparable stimuli and identical tasks: Comparing apples to apples. *Society for Neuroscience Abstracts*. [link](#)

Visscher, K.M., Kahana, M.J., Sekuler, R. (2006). Short-term memory for spectrally and temporally complex sounds: Comparing apples to apples. *Cognitive Neuroscience Society Abstracts*. [link](#)

Dosenbach, N.U.F., **Visscher, K.M.**, Miezin, F.M., Palmer, E.D., Wenger, K.K., Kang, H.C., Grimes, A.L., Burgund, E.D., Schlaggar, B.L., Petersen, S.E. (2005). Mixed blocked/event-related fMRI suggests that anterior cingulate/medial superior frontal cortex and anterior insula form a core network for the instantiation and maintenance of task set. *Society for Neuroscience Abstracts*.

Weissman, D.H., Roberts, K.C., **Visscher, K.M.**, Woldorff, M.G. (2005). The neural correlates of momentary lapses in attention. *Society for Neuroscience Abstracts*.

Visscher, K.M., Palmer, E.D., Kang, H.C., Dosenbach, N.U.F., , Petersen, S.E. (2004). Potential control processes common to a range of tasks: Sustained, task-related fMRI signals examined across 10 tasks. *Society for Neuroscience Abstracts*. [link](#)

Visscher, K.M., Eder, K.E., Miezin, F.M., Petersen, S.E. (2004) Differentiating task-general control activity from task-specific control activity. *Cognitive Neuroscience Society Abstracts*.

Visscher, K.M., Palmer, E. D., Burgund, E. D., Kang, H. C., Miezin, F. M., Lyon, J. K., Buckner, R. L. , Petersen, S. E. (2003). Sustained, block-related activity compared across four tasks shows both common and task-modulated responses. *Cognitive Neuroscience Society Abstracts*.

Wenger, K.K., **Visscher, K.M.**, Miezin, F.M., Petersen, S.E., , Schlaggar, B.L. (2003). Mixed block/event-related designs separate transient and sustained activity in fMRI in children. *Society for Neuroscience Abstracts*.

Visscher, K.M., Miezin, F. M., Lugar, H. M., Bhalodia, V., Kelly, J., Donaldson, D. I., Buckner, R. L. , Petersen, S. E. (2002). A mixed block/event-related paradigm can correctly separate transient and sustained activity in fMRI. *Cognitive Neuroscience Society Abstracts*.

Visscher, K.M., Breneman, M., Miezin, F. M., Buckner, R. L. , Petersen, S. E. (2002). Semantic vs. physical judgments: a mixed block/event-related analysis. *Society for Neuroscience Abstracts*.

Petersen, S. E., **Visscher, K.M.**, Miezin, F. M., Kelly, J. , Buckner, R. L. (2002). Potential limitations on the use of mixed block/event-related designs. *Society for Neuroscience Abstracts*.

Kelly, J. E., **Visscher, K.M.**, McAvoy, M., Petersen, S. E. , Buckner, R. L. (2002). Bay Zero simulation explores methodology of mixed blocked/evented-related functional MRI experiments. *Organization for Human Brain Mapping Abstracts*.

Schlaggar, B. L., Brandling-Bennett, E., **Visscher, K.M.**, Brown, T. T., Palmer, E. D., Miezin, F. M., Snyder, A. Z., Kelley, W. M. , Petersen, S. E. (2000). FMRI in adults performing lexical tasks designed for school age children demonstrates expected patterns of activation. *Society for Neuroscience Abstracts*.