

Michael F. Bonner

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Academic Appointments

Postdoctoral Fellow

Department of Psychology, University of Pennsylvania	2014-present
Department of Neurology, University of Pennsylvania	2013-2014

Education

Ph.D. University of Pennsylvania December 2012
Neuroscience
Advisor: Murray Grossman, M.D., Ed.D.
Thesis: Neural representations at the interface of perception and memory

B.S. Pennsylvania State University December 2005
Biochemistry and Molecular Biology
Minors in Chemistry and Microbiology

Grants and Awards

Postdoctoral Fellows Award, Cognitive Neuroscience Society, 2014

Travel Award for Concepts, Actions, and Objects Workshop, Rovereto, Italy, 2013

National Institute of Neurological Disorders and Stroke, National Institutes of Health,
T32 Neuroscience Neuroimaging Training Grant Trainee, 2009-2012

Judy Lee Writing Award, University of Pennsylvania Creative Writing Program, 2007

Discovery Summer Research Grant, Pennsylvania State University, 2005

Shigley Scholarship in Biochemistry, Pennsylvania State University, 2004-2005

Frank Thomson Scholarship, Pennsylvania State University, 2000-2004

Dean's Honor List, Pennsylvania State University, 2001-2005

Publications

Bonner MF & Epstein RA (2017) Coding of navigational affordances in the human visual system. *Proceedings of the National Academy of Sciences*

Price, AR, Peelle, JE, **Bonner, MF**, Grossman, M & Hamilton, RH (2016) Causal evidence for a mechanism of semantic integration in the angular gyrus as revealed by high-definition transcranial direct current stimulation. *Journal of Neuroscience*, 36(13): 3829-3838.

Bonner MF, Price AR, Peelle JE & Grossman M (2016) Semantics of the visual environment encoded in parahippocampal cortex. *Journal of Cognitive Neuroscience*, 28(3): 361-378

Price AR, **Bonner MF** & Grossman M (2015) Semantic memory: cognitive and neuroanatomic perspectives. In: *Brain Mapping: An Encyclopedic Reference*. Toga AW, Poldrack RA (Eds.) Amsterdam: Elsevier

Price AR, **Bonner MF**, Peelle JE & Grossman M (2015) Converging evidence for the neuroanatomic basis of combinatorial semantics in the angular gyrus. *Journal of Neuroscience*, 35:3276-3284

Bonner MF & Grossman M (2014) The neural basis of semantic memory. In: *Dementia and Memory*. Nilsson L-G, Ohta N (Eds.) Hove: Psychology Press.

Bonner MF & Grossman M (2013) Deficits in semantic memory associated with focal neurodegenerative diseases. In: *The Boston Process Approach to Neuropsychological Assessment: A Practitioner's Guide*. Ashendorf L, Swenson R, Libon DJ (Eds.) Oxford: Oxford University Press.

Bonner MF & Price AR (2013) Where is the anterior temporal lobe and what does it do? *Journal of Neuroscience*, 33:4213-4215.

Bonner MF, Peelle JE, Cook PA & Grossman M (2013) Heteromodal conceptual processing in the angular gyrus. *NeuroImage*, 71:175-186.

Grossman M, Peelle JE, Smith EE, McMillan CT, Cook P, Powers J, Dreyfuss M, **Bonner MF**, Richmond L, Boller A, Camp E & Burkholder L (2013) Category-specific semantic memory: Converging evidence from BOLD fMRI and Alzheimer's disease. *NeuroImage*, 68:263-274.

Bonner MF & Grossman M (2012) Gray matter density of auditory association cortex relates to knowledge of sound concepts in primary progressive aphasia. *Journal of Neuroscience*, 32(23): 7986-7991.

Grossman M, **Bonner MF** & Weinstein J (2011) Music and Semantic Dementia--Reply. *Archives of Neurology*, 68,1089-1090.

Weinstein J, Koenig P, Gunawardena D, McMillan C, **Bonner MF** & Grossman M (2011) Preserved musical semantic memory in semantic dementia. *Archives of Neurology*, 68, 248-250.

Bonner MF, Ash S & Grossman M (2010) The new classification of primary progressive aphasia into semantic, logopenic, or nonfluent/agrammatic variants. *Current Neurology and Neuroscience Reports*, 10(6), 484-490.

Farag C, Troiani V, **Bonner MF**, Powers C, Avants B, Gee J, & Grossman M (2010) Hierarchical organization of scripts: converging evidence from fMRI and frontotemporal degeneration. *Cerebral Cortex*, 20, 2453-5463.

Bonner MF, Vesely L, Price C, Anderson C, Richmond L, Farag C, Avants B & Grossman M (2009) Reversal of the concreteness effect in semantic dementia. *Cognitive Neuropsychology*, 26(6), 568-579.

Vesely L, **Bonner MF**, Reilly J & Grossman M (2007) Free association in semantic dementia: The importance of being abstract. *Brain and Language*, 103(1-2):154-155.

Zhang R, Liu ST, Chen W, **Bonner MF**, Pehrson J, Yen TJ & Adams PD (2007) HP1 proteins are essential for a dynamic nuclear response that rescues the function of perturbed heterochromatin in primary human cells. *Molecular and Cellular Biology*, 27(3):949-62.

Invited Talks

Behavioral & Cognitive Neuroscience Research Retreat, University of Pennsylvania, Philadelphia, PA, 2016
Coding of navigational affordances in the human visual system

Theatre Arts Program, University of Pennsylvania, Philadelphia, PA, 2014
Representations at the interface of perception and memory

Concepts Seminar, Harvard University, Cambridge, MA, 2014
Individual variability in a cortical semantic hub

Olson Lab, Temple University, Philadelphia, PA, 2014
Neuroanatomy of the lexical-semantic system

Department of Psychology, Washington University in St. Louis, St. Louis, MO, 2013
Concepts and the neural interface of perception and memory

Center for Cognitive Neuroscience Colloquium, University of Pennsylvania,
Philadelphia, PA, 2011

The anatomy of concepts: the interface of sensory and language systems in the brain

Conference Talks

Bonner MF, Ryan J & Epstein R. Neural coding of navigational affordances in visual scenes. *Vision Sciences Society*, St. Pete Beach, FL, to be presented May 2016

Price AR, **Bonner MF**, Peelle JE & Grossman M. Neural mechanisms for object semantics: fine-grained feature statistics for object representation. *Society for Neuroscience*, Chicago, IL, October 2015

Price AR, **Bonner MF**, Peelle JE & Grossman M. Neural coding of object knowledge reflects the co-occurrence statistics of the environment. *Vision Sciences Society*, St. Pete Beach, FL, May 2015

Price AR, Hamilton RH, **Bonner MF**, Peelle JE & Grossman M. Modulating language comprehension using HD-tDCS. *NYC Neuromodulation*, New York, NY, January 2015

Price AR, **Bonner MF**, Peelle JE & Grossman M. Modulating conceptual combination using focal non-invasive brain stimulation. *Society for Neuroscience*, Washington D.C., November 2014

Bonner MF, Peelle JE, Price AR & Grossman M. Structural covariance of the semantic memory network in healthy adults. *Society for the Neurobiology of Language*, San Diego, CA, November 2013

Bonner MF, Price AR, Peelle JE & Grossman M. At the interface of visual perception and long-term memory: Object knowledge and the medial temporal lobe. *Workshop on Concepts, Actions, and Objects*, Rovereto, Italy, May 2013

- Selected for a travel award

Bonner MF, Price AR, Peelle JE & Grossman M. At the interface of visual perception and long-term memory: Object knowledge and the medial temporal lobe. *Vision Sciences Society*, Naples, FL, May 2013

Bonner MF, Price AR, Peelle JE & Grossman M. The medial temporal lobe supports visual semantic memory. *Society for the Neurobiology of Language*, San Sebastian, Spain, October 2012

Price AR, **Bonner MF**, Peelle JE & Grossman M. Conceptual combination in the angular gyrus. *Society for Neuroscience*, New Orleans, LA, October 2012

Bonner MF, Price AR, Peelle JE & Grossman M. The medial temporal lobe supports visual conceptual memory. *Society for Neuroscience*, New Orleans, LA, October 2012

Bonner MF, Vesely L, McMillan C, Avants B & Grossman, M. Reversal of the concreteness effect for verbs in semantic dementia. *Society for Neuroscience*, Chicago, IL, October 2009

Bonner, MF. Free association in semantic dementia: The importance of being abstract. *Winter School for the International Research Training Group*, Aachen, Germany, October 2008

Conference Posters

Bonner MF, Ryan J & Epstein R. Neural coding of navigational affordances in visual scenes. *Society for Neuroscience*, Washington D.C., October 2015

Bonner MF, Ryan J & Epstein R. Neural coding of navigational affordances in the local visual environment. *Vision Sciences Society*, St. Pete Beach, FL, May 2015

Bonner MF, Peelle JE, Price AR & Grossman M. Individual variability in a cortical semantic hub. *Society for the Neurobiology of Language*, Amsterdam, Netherlands, August 2014

Price AR, **Bonner MF**, Peelle JE & Grossman M. Modulating conceptual combination using focal non-invasive brain stimulation. *Society for the Neurobiology of Language*, Amsterdam, Netherlands, August 2014

Bonner MF, Peelle JE, Price AR & Grossman M. Individual variability in a cortical semantic hub. *Cold Spring Harbor Laboratory Symposium on Cognition*, Cold Spring Harbor, NY, May 2014

Bonner MF, Peelle JE, Price AR & Grossman M. Individual variability in a cortical semantic hub. *Cognitive Neuroscience Society*, Boston, MA, April 2014

- Selected for a postdoctoral-fellows award

Bonner MF, Peelle JE, Price AR & Grossman M. Structural variability in a large-scale cortical network that relates to individual differences in language performance. *Society for Neuroscience*, San Diego, CA, November 2013

Bonner MF, Peelle JE, Cook P & Grossman M. The angular gyrus supports heteromodal semantic representations. *Society for the Neurobiology of Language*, San Sebastian, Spain, October 2012

Price AR, **Bonner MF**, Peelle JE & Grossman M. Conceptual combination in the angular gyrus. *Society for the Neurobiology of Language*, San Sebastian, Spain, October 2012

Bonner MF, Price AR, Peelle JE & Grossman M. Semantic retrieval recruits heteromodal regions and modality-specific association cortices. *Cognitive Neuroscience Society*, Chicago, IL, April 2012

Price AR, **Bonner MF**, Peelle JE & Grossman M. When concepts combine: semantic processing in the angular gyrus. *Cognitive Neuroscience Society*, Chicago, IL, April 2012

Bonner MF & Grossman M. When concepts go quiet: Reduced gray matter in auditory association cortex relates to knowledge of sound concepts in primary progressive aphasia. *Society for Neuroscience*, Washington D.C., November 2011

Price AR, **Bonner MF**, Peelle JE & Grossman M. The representations of sensory-motor word features during a semantic association task. *Society for Neuroscience*, Washington D.C., November 2011

Bonner MF & Grossman M. When concepts go quiet: Reduced gray matter in auditory association cortex relates to knowledge of sound concepts in primary progressive aphasia. *Society for the Neurobiology of Language*, Annapolis, MD, November 2011

Price AR, **Bonner MF**, Peelle JE & Grossman M. The representations of sensory-motor word features during a semantic association task. *Society for the Neurobiology of Language*, Annapolis, MD, November 2011

Bonner MF, Peelle JE & Grossman M. The role of angular gyrus and sensory-motor association cortices in representing word meanings: An fMRI study. *Cognitive Neuroscience Society*, San Francisco, CA, April 2011

Price AR, **Bonner MF**, Peelle JE & Grossman M. Word associations involve modality-specific cortices. *Cognitive Neuroscience Society*, San Francisco, CA, April 2011

Bonner MF & Grossman M. Sound, sight and action in meaning: fMRI evidence of word representations in perceptual and motor cortices. *Society for Neuroscience*, San Diego, CA, November 2010

Dreyfuss M, Smith EE, McMillan C, Gunawardena D, Richmond L, **Bonner MF** & Grossman M. Neural representation of word meaning: an fMRI study. *Society for Neuroscience*, San Diego, CA, November 2010

Grossman M, Smith EE, Gunawardena DE, Dreyfuss M, Richmond L, **Bonner MF** & McMillan C. Neural representation of word meaning in healthy seniors: an fMRI study. *Society for Neuroscience*, San Diego, CA, November 2010

Bonner MF & Grossman M. Sound, sight and action in meaning: fMRI evidence of word representations in perceptual and motor cortices. *Neurobiology of Language Conference*, San Diego, CA, November 2010

Dreyfuss M, Smith EE, McMillan C, Gunawardena D, Richmond L, **Bonner MF** & Grossman M. Neural representation of word meaning: an fMRI study. *Neurobiology of Language Conference*, San Diego, CA, November 2010

Grossman M, Smith EE, Gunawardena DE, Dreyfuss M, Richmond L, **Bonner MF** & McMillan C. Neural representation of word meaning in healthy seniors: an fMRI study. *Neurobiology of Language Conference*, San Diego, CA, November 2010

Bonner MF & Grossman M. Turning down the volume on semantics: Impaired knowledge of sound words in logopenic progressive aphasia. *Cognitive Neuroscience Society*, Montreal, Canada, April 2010

Bonner MF, Vesely L, McMillan C, Avants B & Grossman, M. Reversal of the concreteness effect for verbs in semantic dementia. *Neurobiology of Language Conference*, Chicago, IL, October 2009

Farag C, McCluskey L, Elman L, Goldmann Gross R, **Bonner MF** & Grossman M. Insensitive to hierarchy: ALS and FTD display overlapping executive impairment. *American Academy of Neurology*, Seattle, WA, April 2009

Vesely L, **Bonner MF**, Reilly J & Grossman M. Free association in semantic dementia: The importance of being abstract. *Academy of Aphasia*, Washington D.C., October 2007

Other Research Experience

Fox Chase Cancer Center, Philadelphia, PA

Scientific Technician, 2006

Genome Stability Group, Laboratory of Dr. Peter Adams

Investigation of cellular responses to chromatin damage, involving the characterization of protein and gene expression changes in human fibroblasts.

Pennsylvania State University, State College, PA

Undergraduate Research, 2004-2005

Center for Gene Regulation, Laboratory of Dr. Song Tan

Structural and biochemical investigations of chromatin-modifying protein complexes through vector-mediated protein expression in bacteria and chromatographic purification.

Teaching Experience

Guest lecture on semantic memory in the Pre-Freshman Program, 2013

University of Pennsylvania

Guest lecture on magnetic resonance imaging in BE 483: Molecular Imaging, 2009
University of Pennsylvania

Teaching assistant for BBB 109: Introduction to Brain and Behavior, 2009
University of Pennsylvania

Chemistry and Physics tutor for the Comprehensive Studies Program, 2004-2005
Pennsylvania State University

Mentoring:

Talya Kramer	Undergraduate student, University of Pennsylvania, 2014
Jaime McKenna	Undergraduate student, University of Pennsylvania, 2012-2013
Nishant Neel	Undergraduate student, University of Pennsylvania, 2012
Vanessa Chuo	Undergraduate student, University of Pennsylvania, 2011
Thomas Case	High school student, Germantown Friends School, 2010
Amanda Fielding	Undergraduate student, Holy Family University, 2007

Training:

Methods in Biomedical Science and Engineering Education, BE 895, 2009
University of Pennsylvania

Public Engagement

Presentation on careers in neuroscience during career day at Northwood Academy
Charter School, Philadelphia, 2014

Member of a discussion panel at a public event on the science of sound, in collaboration
with Pig Iron Theatre Company, 2014

Discussion leader on neurodegenerative disease and language impairments at the Penn
Neuroscience Boot Camp, 2011

Professional Service

Occasional reviewer for:

- Brain and Language
- Cerebral Cortex
- Cognitive and Behavioral Neurology
- Cortex
- Current Biology
- Journal of Cognitive Neuroscience
- Journal of Neuroscience
- NeuroImage
- Psychology Press

- Scientific Reports

Professional memberships:

- Cognitive Neuroscience Society
- Society for Neuroscience
- Society for the Neurobiology of Language
- Vision Sciences Society