

# Michael F. Bonner

## CONTACT INFORMATION

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University of Pennsylvania  
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## ACADEMIC APPOINTMENTS

Assistant Professor	Department of Cognitive Science, Johns Hopkins University	starting January 2019
Postdoctoral Fellow	Department of Psychology, University of Pennsylvania	2014-present
	Department of Neurology, University of Pennsylvania	2013-2014

## EDUCATION

PhD	University of Pennsylvania Neuroscience Advisor: Professor Murray Grossman Thesis: Neural representations at the interface of perception and memory	December 2012
BS	Pennsylvania State University Biochemistry and Molecular Biology Minors in Chemistry and Microbiology	December 2005

## GRANTS AND AWARDS

Postdoctoral Fellows Award, Cognitive Neuroscience Society	2014
Travel Award for Concepts, Actions, and Objects Workshop	2013
NIH T32 Neuroimaging Trainee	2009-2012
Judy Lee Writing Award, Penn 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  
Dean's Honor List, Pennsylvania State University

2000-2004  
2001-2005

## PREPRINTS

1. Price AR, **Bonner MF**, Peelle JE & Grossman M (2017) Neural coding of fine-grained object knowledge in perirhinal cortex. *bioRxiv*, doi: 10.1101/194829

## PUBLICATIONS

1. **Bonner MF** & Epstein RA (2017) Computational mechanisms underlying cortical responses to the affordance properties of visual scenes. *PLOS Computational Biology*. 14:e1006111
2. **Bonner MF** & Epstein RA (2017) Coding of navigational affordances in the human visual system. *Proceedings of the National Academy of Sciences*, 114(18): 4793-8
3. 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): 3829-38
4. **Bonner MF**, Price AR, Peelle JE & Grossman M (2016) Semantics of the visual environment encoded in parahippocampal cortex. *Journal of Cognitive Neuroscience*, 28(3): 361-78
5. Price AR, **Bonner MF** & Grossman M (2015) Semantic memory: cognitive and neuroanatomical perspectives. In: *Brain Mapping: An Encyclopedic Reference*. Toga AW, Poldrack RA (Eds.), Waltham: Academic Press. 529-36
6. 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: 3276-84
7. **Bonner MF** & Grossman M (2014) The neural basis of semantic memory. In: *Dementia and Memory*. Nilsson L-G, Ohta N (Eds.) Hove: Psychology Press. 207-24
8. **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. 200-16
9. **Bonner MF** & Price AR (2013) Where is the anterior temporal lobe and what does it do? *Journal of Neuroscience*, 33: 4213-5

10. **Bonner MF**, Peelle JE, Cook PA & Grossman M (2013) Heteromodal conceptual processing in the angular gyrus. *NeuroImage*, 71: 175-86
11. 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: 263-74
12. **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): 7986-91
13. Grossman M, **Bonner MF** & Weinstein J (2011) Music and Semantic Dementia—Reply. *Archives of Neurology*, 68: 1089-90
14. Weinstein J, Koenig P, Gunawardena D, McMillan C, **Bonner MF** & Grossman M (2011) Preserved musical semantic memory in semantic dementia. *Archives of Neurology*, 68: 248-50
15. **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): 484-90
16. 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: 2453-63
17. **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): 568-79
18. 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): 154-5
19. 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

## CONFERENCE TALKS

1. **Bonner MF** & Epstein R. Computational mechanisms underlying the cortical analysis of affordance properties in visual scenes. *Society for Neuroscience*, Washington D.C., November 2017
2. **Bonner MF** & Epstein R. Neural coding of navigational affordances in visual scenes. *Society for Neuroscience*, San Diego, CA, November 2016
  - Organized a session on Scene Perception and Spatial Navigation and served as chair
3. **Bonner MF**, Ryan J & Epstein R. Neural coding of navigational affordances in visual scenes. *Vision Sciences Society*, St. Pete Beach, FL, May 2016
4. 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
5. 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
6. Price AR, Hamilton RH, **Bonner MF**, Peelle JE & Grossman M. Modulating language comprehension using HD-tDCS. *NYC Neuromodulation*, New York, NY, January 2015
7. 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
8. **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
9. **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
10. **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

11. **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
12. Price AR, **Bonner MF**, Peelle JE & Grossman M. Conceptual combination in the angular gyrus. *Society for Neuroscience*, New Orleans, LA, October 2012
13. **Bonner MF**, Price AR, Peelle JE & Grossman M. The medial temporal lobe supports visual conceptual memory. *Society for Neuroscience*, New Orleans, LA, October 2012
14. **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
15. **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

1. **Bonner MF** & Epstein R. Computational mechanisms underlying fMRI responses to affordance properties in visual scenes. *Conference on Cognitive Computational Neuroscience*, New York, NY, September 2017
2. **Bonner MF** & Epstein R. Coding of navigational affordances in the human visual system. *Statistical Analysis of Neural Data Workshop*, Pittsburgh, PA, June 2017
3. **Bonner MF** & Epstein R. Computational mechanisms for identifying the navigational affordances of scenes in a deep convolutional neural network. *Vision Sciences Society*, St. Pete Beach, FL, May 2017
4. Price AR, **Bonner MF**, Peelle JE & Grossman M. A common, fine-grained code for object meaning in perirhinal cortex. *Society for Neuroscience*, San Diego, CA, November 2016
5. Price AR, **Bonner MF**, Peelle JE & Grossman M. Intersubject similarity of multivoxel codes in perirhinal cortex reflects the typicality of visual objects. *Vision Sciences Society*, St. Pete Beach, FL, May 2016
6. **Bonner MF**, Ryan J & Epstein R. Neural coding of navigational affordances in visual scenes. *Society for Neuroscience*, Chicago, IL, October 2015

7. Price AR, Peelle JE, **Bonner MF**, Grossman M & Hamilton RH. Altering mechanisms of combinatorial semantics through brain stimulation to the angular gyrus. *Society for the Neurobiology of Language*, Chicago, IL, October 2015
8. **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
9. **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
10. 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
11. **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
12. **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
13. **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
14. **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
15. 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
16. **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
17. Price AR, **Bonner MF**, Peelle JE & Grossman M. When concepts combine: semantic processing in the angular gyrus. *Cognitive Neuroscience Society*, Chicago, IL, April 2012

18. **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
19. 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
20. **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
21. 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
22. **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
23. Price AR, **Bonner MF**, Peelle JE & Grossman M. Word associations involve modality-specific cortices. *Cognitive Neuroscience Society*, San Francisco, CA, April 2011
24. **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
25. 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
26. 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
27. **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
28. 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

29. 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
30. **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
31. **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
32. 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
33. 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

#### INVITED TALKS

- Behavioral & Cognitive Neuroscience Retreat, University of Pennsylvania 2016
- Theatre Arts Program, University of Pennsylvania 2014
- Concepts Seminar, Harvard University 2014
- Cognitive Neuroscience Lab, Temple University 2014
- Department of Psychology, Washington University in St. Louis 2013
- Center for Cognitive Neuroscience Colloquium, University of Pennsylvania 2011

#### OTHER RESEARCH EXPERIENCE

Fox Chase Cancer Center, Philadelphia, PA, 2006  
*Scientific Technician*, Genome Stability Group, Lab of Dr. Peter Adams

Pennsylvania State University, State College, PA, 2004-2005  
*Undergraduate Research*, Center for Gene Regulation, Lab of Dr. Song Tan

#### TEACHING

##### *Experience:*

- Guest lecture on memory, Pre-Freshman Program, University of Pennsylvania, 2013

- Guest lecture on MRI, BE 483: Molecular Imaging, University of Pennsylvania, 2009
- Teaching assistant, BBB 109: Introduction to Brain and Behavior, University of Pennsylvania, 2009
- Tutor for chemistry and physics, Comprehensive Studies Program of the Pennsylvania State University, 2004-2005

*Mentoring:*

- Conor Gibbons High school student, Holy Ghost Preparatory School, 2015
- 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, University of Pennsylvania, 2009

**PUBLIC ENGAGEMENT**

- Presentation on neuroscience during career day at Northwood Academy Charter School, Philadelphia, PA, 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**

*Ad hoc reviewer:*

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

- Scientific Reports

*Professional memberships:*

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