

# Nancy A. Dennis, PhD

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## **Education**

- 2004 The Catholic University of America, Ph.D., Experimental Psychology, (with Distinction)  
2001 The Catholic University of America, M.A., Experimental Psychology, (with Honors)  
1997 University of Rochester, B.A., Psychology  
1997 University of Rochester, B.A., Brain and Cognitive Sciences, (with Honors)

## **Academic and Professional Experience**

- 2004 – present Postdoctoral Fellow with Prof. Roberto Cabeza, Ph.D., Duke University  
2004 – 2007 Research Fellow, Center for Aging and Human Development, Duke University Medical Center  
1999 – 2004 Research Assistant, The Cognitive Aging Lab, The Catholic University of America  
1999 – 2004 Graduate Student with Prof. James H. Howard, Ph.D., The Catholic University of America  
*Dissertation title:* “Age deficits in implicit sequence learning with response remapping”  
*Master’s thesis:* “Age-related deficits in implicit learning of auditory sequences”  
1997 – 1999 Research Assistant with Drs. Salvadore Soraci, & Michael Carlin, Ph.Ds., Eunice Kennedy Shriver Center, University of Massachusetts Medical School  
1996 – 1997 Research Assistant with Prof. James R. Ison, Ph.D., University of Rochester

## **Honors and Awards**

- 2004-2007 Post-doctoral Training Fellowship (NIH/NIA T32 AG000029-30, Behavior and Physiology in Aging), Center for Aging and Human Development, Duke University Medical Center  
2004 Completion of Ph.D. Oral Exam with Distinction  
2004 American Psychological Association Dissertation Award (\$1000 direct costs towards research)  
2002 McDonnell Fellowship, Summer Institute in Cognitive Neuroscience, Dartmouth Medical School  
2002 Completion of Ph.D. Comprehensive Examination with Honors  
1993-1997 University of Rochester Trustees’ Scholarship

## **Research Interests**

### Episodic Memory

- encoding and retrieval processes
- item, relational memory and false memory

### Cognitive Aging

- item, relational, and false memory
- compensation
- explicit vs. implicit memory

### Neuroimaging

- fMRI
- DTI
- genetic imaging

#### Implicit Learning

- sequence learning
- priming

### **Publications : Peer-Reviewed Journals**

#### **Under review**

Dennis, N.A., Hayes, S.M., Prince, S.E., Madden, D.J., Huettel, S.A., & Cabeza, R. (under review). Effects of Aging on the Neural Correlates of Successful Item and Source Memory Encoding.

Daselaar, S.M., Prince, S.E., Dennis, N.A., & Cabeza, R. (under review). Activity in poster midline and lateral parietal regions is beneficial to episodic retrieval but detrimental to encoding.

Howard, J.H., Jr., Howard, D.V., Dennis, N.A., & Kelly, A.J. (revision submitted). Implicit learning of predictive relationships in three-event visual sequences by young and old adults.

#### **In Press**

Dennis, N.A., Kim, H., & Cabeza, R. (in press). Age-related differences in brain activity during true and false memory retrieval. *Journal of Cognitive Neuroscience*.

Davis, S.W., Dennis, N.A., Fleck, M., Daselaar, S.M., & Cabeza, R. (in press). Que PASA?: the posterior-anterior shift in aging. *Cerebral Cortex*.

Howard, D.V., Howard, J.H., Jr., Dennis, N.A., LaVine, S., & Valentino, K. (in press). Aging and implicit learning of a simple association. *Journal of Gerontology B: Psychological Sciences*.

Dennis, N.A., Kim, H., & Cabeza, R. (in press). Effects of aging on true and false memory formation: an fMRI study. *Neuropsychologia*.

Howard, J.H., Jr., Howard, D.V., Dennis, N.A., & Yankovich, H. (in press). Event timing and age-deficits in higher-order sequence learning. *Aging, Neuropsychology, and Cognition*.

Dennis, N.A., Daselaar, S., & Cabeza, R. (2007). Effects of aging on transient and sustained successful memory encoding activity. *Neurobiology of Aging*, 28(11): 1749-1758.

Dennis, N.A., Howard, J.H., Jr., & Howard, D.V. (2006). Implicit sequence learning without motor sequencing in young and old adults. *Experimental Brain Research*, 175(1): 153-64.

Howard, J.H., Jr., Howard, D.V., Dennis, N.A., Yankovich, H., & Vaidya, C.J. (2004). Implicit spatial contextual learning in healthy aging. *Neuropsychology*, 18(1): 124-134.

Dennis, N.A., Howard, J.H., Jr., & Howard, D.V. (2003). Age-related deficits in learning sequences of spoken words. *Journal of Gerontology B: Psychological Sciences*, 58: 224-227.

Carlin, M.T., Soraci, S.A., Strawbridge, C.P., Dennis, N.A., Loiselle, R., Chechile, N.A. (2003). Detection of changes in naturalistic scenes: Evidence of intelligence-related differences. *American Journal on Mental Retardation*, 108(3): 181-193.

Mackay, H.A., Soraci, S.A., Carlin, M.T., Dennis, N.A., & Strawbridge, C.P. (2002). Guiding visual attention during acquisition of matching to sample. *American Journal on Mental Retardation*, 107(6): 445-454.

Carlin, M.T., Soraci, S.A., Dennis, N.A., Strawbridge, C., & Chechile, N.A. (2002). Guided visual search in individuals with mental retardation. *American Journal on Mental Retardation*, 107(4): 237-251.

Carlin, M.T., Soraci, S.A., Dennis, N.A., Chechile, N.A., & Loiselle, R.C. (2001). Enhancing free recall rates of individuals with mental retardation. *American Journal on Mental Retardation*, 106(4): 314-326.

### **In preparation**

Dennis, N.A., LaBar, K., Goldstein, D., Need, A., Waters, S., & Cabeza, R. Relational memory: Effects of COMT genotype on PFC and hippocampal circuitry.

Dennis, N.A., Browndyke, J., Welsh-Bohmer, K., Stokes, J. & Cabeza, R. The effects of APOE genotype on the neural correlates of episodic encoding in healthy young.

Davis, S.W., Dennis, N.A., Buchler, N., White, L.E., Madden, D.J., & Cabeza, R. Assessment of age-related changes in white-matter structure using DTI and tensor-based tractography.

Dennis, N.A. & Marsh, E.J. Learning errors from fiction: Inferences and misinformation.

Madden, D.J., Spaniol, J., Costello, M., Bucur, B., White, L., Cabeza, R., Davis, S.W., Dennis, N.A., Provenzale, & Huettel, S.A. Cerebral white matter integrity mediates adult age differences in cognitive performance.

Spaniol, J., Madden, D.J., Bucur, B., Moore, S.E., Huettel, S.A., Dennis, N.A., & Cabeza, R. Neural correlates of episodic retrieval in younger and older adults.

Dennis, N.A., Daselaar, S.M., & Cabeza, R. Age-related dedifferentiation in implicit and explicit learning systems.

### **Book Chapters**

#### **In press**

Dennis, N.A. & Cabeza, R. (in press). Neuroimaging of Healthy Cognitive Aging. In F.E.M. Craik & T. Salthouse (Eds.). *Handbook of Cognitive Aging*, 3<sup>rd</sup> Edition.

Daselaar, S., Dennis, N., & Cabeza, R. (in press). Age-related changes in the neural substrates of episodic and working memory. Functional neuroimaging evidence. In S. Rombouts, F. Barkhof, and P. Scheltens (Eds.). *Clinical Applications of Functional Brain MRI*, Oxford University Press.

### **Conference Presentations**

Prince S.E., Daselaar, S.M., Dennis, N.A. & Cabeza, R. (2007). The default mode enigma: Activity in lateral parietal and posterior midline regions is beneficial for episodic retrieval but detrimental to encoding. *Poster presented at the 14<sup>th</sup> Annual Cognitive Neuroscience Society Conference, New York, NY.*

- Dennis, N.A., Waters, S.W., Need, A., LaBar, K.S., Goldstein D.B., & Cabeza, R. (2007). Effects of COMT genotypes on prefrontal and hippocampal activity during successful relational memory encoding and retrieval. *Poster presented at the 14<sup>th</sup> Annual Cognitive Neuroscience Society Conference, New York, NY.*
- Davis, S.W., Dennis, N.A., Thomas, V.A., Emery, M.R. Tarter, A.B., White, L.E., Madden, D.J., & Cabeza, R. (2007). Assessment of age-related changes in white-matter structure using DTI and tensor-based tractography. *Poster presented at the 14<sup>th</sup> Annual Cognitive Neuroscience Society Conference, New York, NY.*
- Hayes, S.M. Dennis, N.A., Prince, S.E., Huettel, S.A., Madden, D.J., & Cabeza, R. (2007). Effects of aging on neural correlates of item and relational memory. *Poster presented at the 14<sup>th</sup> Annual Cognitive Neuroscience Society Conference, New York, NY.*
- Dennis, N.A., Kim, H., Cabeza, R. (2006). The neural basis of true and false recognition in aging. *Talk presented at the 35<sup>th</sup> Annual Society for Neuroscience Conference.*
- Davis, S.W., Dennis, N.A., Cabeza, R. (2006) Que PASA?: the posterior-anterior shift in aging. *Poster presented at the 35<sup>th</sup> Annual Society for Neuroscience Conference, Atlanta, GA.*
- Dennis, N.A., Kim, H. & Cabeza, R. (2006) Age differences in true and false memory formation: and fMRI study. *Poster presented at the 11<sup>th</sup> Cognitive Aging Conference, Atlanta, GA.*
- Dennis, N.A., Daselaar, S., Cabeza, R. (2005). Distinguishing age-related changes in transient vs. sustained successful encoding activity using a hybrid fMRI approach. *Poster presented at the 34<sup>th</sup> Annual Society for Neuroscience Conference, Washington, DC.*
- Howard, J.H., Jr., Howard, D.V., Yankovich, H., & Dennis, N.A. (2004). Does degrading visual displays mimic age-related implicit sequence learning deficits? *Poster presented at the 57<sup>th</sup> Gerontological Society of America Annual Meeting, Washington, D. C.*
- Howard, J.H., Jr., Kelly, A.J., Dennis, N.A., Vaidya, C., Barr, R., & Howard, D.V. (2004) Age-related deficits in implicit learning of higher-order sequential structure in the absence of motor sequencing. *Poster presented at the 10<sup>th</sup> Cognitive Aging Conference, Atlanta, GA.*
- Dennis, N.A., Howard, J.H., Jr., & Howard, D.V. (2003). Implicit learning of higher order auditory sequences with response remapping in young and elderly adults. *Poster presented at the 10<sup>th</sup> Annual Cognitive Neuroscience Society Conference, New York, NY.*
- Dennis, N.A., Howard, J.H., Jr., Howard, D.V., Coyle, M., Lynch, B., & Bradley, N. (2003). Implicit higher-order sequence learning by event observation. *Poster presented at the 74<sup>th</sup> Annual Eastern Psychological Association Conference, Baltimore, MD.*
- Dennis, N.A., La Vine, S.P., Howard, DV., Howard, J.H., Jr. (2002). Aging and implicit learning of a simple regularity: Evidence for learning independent of stimulus characteristics. *Poster presented at the 55<sup>th</sup> Gerontology Society of America Annual Meeting, Boston, MA.*
- Dennis, N.A., Howard, J.H., Jr., & Howard, D.V. (2002). Implicit sequence learning with response remapping in young and elderly adults. *Poster presented at the 32<sup>nd</sup> Annual Society for Neuroscience Conference, Orlando, FL.*
- Howard, J.H., Jr., Howard, D.V., Dennis, N.A., Vaidya, C., & Japikse, K.C. (2002). Perceptual learning

of visual context in healthy elderly. *Poster presented at the 9<sup>th</sup> Cognitive Aging Conference, Atlanta, GA.*

Howard, D.V., La Vine, S.P., Dennis, N.A., Howard, J.H., Jr. (2001). Aging and implicit learning of a simple positional/sequential regularity. *Poster presented at the 31st Annual Society For Neuroscience Conference, San Diego, CA.*

Yamada, H.M., Dennis, N.A., Howard, J.H., Jr., & Howard, D.V. (2001). The influence of event duration variability on the implicit learning of serial patterns. *Poster presented at the 72nd Annual Eastern Psychological Association Conference, Washington, D.C.*

Dennis, N.A., Howard, J.H., Jr., & Howard, D.V. (2001). Age -related deficits in implicit learning of auditory sequences. *Poster presented at the 8<sup>th</sup> Annual Cognitive Neuroscience Society Conference, New York, NY.*

Carlin, M.T., Soraci, S.A., Dennis, N.A., & Chechile, N.A. (1999). Guided visual search. *Paper presented at the 32nd Annual Gatlinburg Conference on Research and Theory in Mental Retardation and Developmental Disabilities, Charleston, SC.*

Soraci, S.A., Dennis, N.A., Carlin, M.T., & Chechile, N.A. (1999). Enhancing free recall in individuals with mental retardation. *Paper presented at the 32nd Annual Gatlinburg Conference on Research and Theory in Mental Retardation and Developmental Disabilities, Charleston, SC.*

Mackay, H.A., Soraci, S.A., Carlin, M.T., Chechile, N.A., & Dennis, N.A. (1999). Guiding visual attention in young children. *Paper presented at the 32nd Annual Gatlinburg Conference on Research and Theory in Mental Retardation and Developmental Disabilities, Charleston, SC.*

Carlin, M.T., Soraci, S.A., Chechile, N., & Dennis, N. (1998). Facilitating visual attention. In W. J. McIlvane (Chair), *Studies of stimulus control in mental retardation: Integrating methods and perspectives. Symposium conducted at the 31st Annual Gatlinburg Conference on Research and Theory in Mental Retardation and Developmental Disabilities, Charleston, SC.*

### **Invited Talks**

Dennis, N.A. (2006). Cognitive Neuroscience of Aging: fMRI studies of episodic memory. *University of South Carolina*

Dennis, N.A. & Bucur, B. (2005). Explanations for Age-Related Cognitive Differences: An Overview of Cognitive Aging Psychology. *Center for Aging, Duke University Medical Center*

Dennis, N.A. (2005). Separable Memory Systems: Implicit and Declarative Learning in Healthy Aging. *University of North Carolina at Chapel Hill*

Dennis, N.A. (2004) Separable Memory Systems: Implicit and Declarative Learning in Healthy & Pathological Aging, *Center for Cognitive Neuroscience, Duke University*

Dennis, N.A. (2004). Cognitive Aging: Implicit Sequence Learning & Episodic Encoding. *CAROT Meeting, Center for Aging, Duke University Medical Center*

Dennis, N.A. (2004). Aging & Implicit Learning: The Importance of Motor and Perceptual Learning in Healthy Aging. *Duke University*

Dennis, N.A. (2004). Aging & Implicit Learning: The Importance of Motor and Perceptual Learning in Healthy Aging. *Washington University in St. Louis*

Dennis, N.A. (2004). Aging & Implicit Learning: The Importance of Motor and Perceptual Learning in Healthy Aging. *National Institute of Aging*

Dennis, N.A. (2003). Aging & Implicit Learning: The Importance of Motor and Perceptual Learning in Healthy Aging. *The Catholic University of America*

**Teaching Interests**

Cognitive Neuroscience of Memory • Cognitive Neuroscience of Aging • Cognitive Aging • Statistics & Methods • Introduction to Psychology • Cognitive Psychology

**Teaching Experience**

2007           Lecturer, Principles of Cognitive Neuroscience, Duke University  
 2003           Instructor, Lab in Sensation & Perception, The Catholic University of America  
 2003           Teaching Assistant, Sensation & Perception, The Catholic University of America  
 2002 & 2003   Instructor, Lab in Cognition, The Catholic University of America  
 2002 & 2003   Teaching Assistant, Cognition, The Catholic University of America  
 2002 & 2003   Lecturer, Introduction to Psychology, The Catholic University of America  
 2001           Teaching Assistant, Statistics, The Catholic University of America

**Ad Hoc Reviewer**

Cerebral Cortex • Journal of Experimental Psychology: Learning Memory & Cognition • Neurobiology of Aging • NeuroImage • Psychology & Aging

**Mentoring**

2004–present   *Center for Cognitive Neuroscience, Duke University.*  
 Mentored undergraduate and graduate research on memory using behavioral and fMRI methods  
 Supervised undergraduate research assistants  
 1999–2004     *Department of Psychology, The Catholic University of America*  
 Mentored undergraduate and graduate research on implicit learning and aging  
 Supervised undergraduate research assistants