Catherine M. Carpenter

Student at The Pennsylvania State University

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Education

Ph.D. Psychology   Expected May 2025

The Pennsylvania State University – University Park, PA

M. S. Psychology   May 2022

The Pennsylvania State University – University Park, PA

B.S. Psychology, Biology Minor

The Pennsylvania State University – University Park, PA   May 2020

Study Abroad

City, University of London, London, England
Study Abroad program, Spring 2019

Research Experience

Graduate Student   August 2020 - Present

Cognitive Aging and Neuroimaging Laboratory: *The Pennsylvania State University*
PI: Nancy Dennis

- Programming tasks in PsychoPy, Using online interfaces such as Pavlovia and Prolific to collect data
- Writing and editing manuscripts
- Working with the IRB
- Scheduling and scanning fMRI participants on NIH grant
- Preprocessing in fMRIprep and SPM12, univariate and multivariate analyses in SPM12
- Study design for NSF and R56 grant
- Programming and developing analyses for neuroimaging data in MATLAB, SPM12, FSL
- Overseeing a team of undergraduate research assistants

Co-Investigator   May 2018 - Present

Elon University
PI: Amy Overman

- fMRI scanning and analysis on NIH and RO1 grant in collaboration
- R56 grant for behavioral and neuroimaging project in collaboration

Co-Investigator   September 2022 - Present

The Pennsylvania State University

PI: Frank Hillary

- Breadth project on healthy aging, traumatic brain injury and resting state functional connectivity
- Developing skills in resting state network analysis

Undergraduate Research Assistant   December 2017 – August 2020

Cognitive Aging and Neuroimaging Laboratory: The Pennsylvania State University

PI: Nancy Dennis

- Administration of behavioral and neuroimaging tests to both younger and older adults
- Collection fMRI data in both older and younger adults
- Preprocessing and modeling of MRI data using SPM12 implemented in MATLAB
- Behavioral data analysis using SPSS
- Programming with E-Prime and MATLAB
- Managed research team of 3 to 5 undergraduate research assistants
- Worked on NIH funded grant in conjunction with a research team at Elon University
- Stimulus design
- Writing manuscripts
- Foundational lab duties: maintenance of participating database, calling and recruiting older adults, management of SONA

Peer-Reviewed Publications

Note: * indicates co-authors

1) Kurkela, K., **Carpenter, C. M.,** Babu, H., Chamberlain, J., & Dennis, N. A. (2021). The effect of memory cue duration on performance in the directed forgetting paradigm in healthy aging. *Aging, neuropsychology and cognition.*
2) Dennis, N. A., Overman, A. A., **Carpenter, C. M.,** and Gerver, C. R. (2022). Understanding associative false memories in aging using multivoxel pattern analyses. *Aging, Neuropsychology and Cognition.*
3) **Carpenter, C. M**., Webb, C., Overman, A. A., & Dennis, N. A. (2022). Contextual similarity negatively affects associative memory performance in both younger and older adults. *Memory*.
4) *Ricupero, S., ***Carpenter, C. M.,** Steinkrauss, A., Gerver., C. R., Chamberlain., J. D., Overman., A. A. & Dennis, N., A. (2023). Neural distinctiveness and reinstatement of hippocampal representations supports associative unitization. *Brain Research*

5) **Carpenter, C. M.** & Dennis, N. A. (2023). Does unitization really function like items? [The role of time and interference on item and associative memory processes](). *Memory and Cognition.*

6) **Carpenter, C. M.** & Dennis, N. A. Neural similarity of schematic information overrides new information, irrespective of target or lure information. *Accepted at Memory for False Memory special issue pending revisions.*

7) Steinkrauss, A. C., **Carpenter, C. M.,** Tarkenton, M. K., Overman, A. A. & Dennis, N. A. (2023). Neural Distinctiveness and discriminability in core network representations support associative unitization. *Aging Brain.*

8) Dennis, N. A.*, **Carpenter, C. M.*** & Becker, A. A*. Review of the neural correlates and representations of unitization. Invited CABN Review.

Chapters

9) Dennis, N. A., Chamberlain, J. D., & **Carpenter, C. M**. Chapter: 10 False memories. *SAGE handbook of cognitive and systems neuroscience.* (2023).

In Prep Publications:

1) Steinkrauss, A. C., **Carpenter, C. M.,** Overman, A. A. & Dennis, N. A. Logical orientation and proximity work together to promote associative memory in older adults (Submitted).

Pre-prints

1) [Dennis, N.*, **Carpenter, C. M.*,** & Becker, A.*]() (2023, September 21). Examining the neural basis of unitization: A review.

2) [Steinkrauss, A. C., **Carpenter, C. M.,** Tarkenton, M. K., Overman, A. A. & Dennis, N. A.]() (2023, May 16). Neural Distinctiveness and discriminability in core network representations support associative unitization. *Accepted at Aging Brain*.

3) [Dennis, N., Chamberlain, J., & **Carpenter, C. M**]() (2022, August 31). False Memories: What Neuroimaging Tells Us About How We Mis-remember the Past.

4) [**Carpenter, C. M.,** Webb, C., Overman, A. A., & Dennis, N.]() (2022, February 24). Within-category similarity negatively affects associative memory performance in both younger and older adults. Now published at *Memory*.

5) [**Carpenter, C. M.,** & Dennis, N.]() (2022, June 14). Does unitization really function like items? The role of time and interference on item and associative memory processes. Now published at *Memory and Cognition.*

6) Dennis, N. A., Overman, A. A., Carpenter, C. M., & Gerver, C. R. (2021). Understanding associative false memories in aging using multivariate analyses. *bioRxiv*, 2021-07. Now published in *Aging, Neuropsychology, and Cognition*.

Pre-Registrations

1) Carpenter, C. M., & Dennis, N. A. (2022, March 25). Similarity of neural representations of schematic targets and lures predict memory performance at retrieval in older adults. https://doi.org/10.17605/OSF.IO/MTD8R

2) Dennis, N.A., Steinkraus, A. C., Carpenter, C.M., Chamberlain, J. D. Understanding the contributions of individual differences to domain-general and domain-specific components of false memories in both young and older adults. (OSF preregistration).

3) Dennis, N. A., Overman, A. A., Levy, A., Becker, A., Carpenter, C. M. (2022, November 3). Understanding the neural mechanisms underlying the benefits of unitization on associative memory in younger and older adults. https://osf.io/hyztp

4) Carpenter, C. M., Mullin, H., Cwiek, A., Carter, E., Vervoordt, S., Lan, G., … Hillary, F. (2023, August 1). Reproducibility of subcortical memory networks in healthy aging and after brain injury. https://doi.org/10.17605/OSF.IO/5KX9W

Posters

10) **Carpenter, C. M**. & Dennis, N. A. (March 2023). Neural similarity of schematic information overrides new information, irrespective of target or lure information. Poster to be presented at Cognitive Neuroscience Society 2023.

9) Steinkrauss, A. C., **Carpenter, C. M.,** Overman, A. A., & Dennis., N. A. (November 2022). Unitization Paradigm using Gestalt Principles Enhances Memory Recognition in Aging. Presented at Psychonomics 2022.

8) **Carpenter, C. M**., Thomas., A. & Dennis, N. A. (March 2022). Memory supports as we age: How unitization functions over time and interference in younger and older adults. Poster presented at Cognitive Aging Conference 2022.

7) **Carpenter, C. M**., Gerver, C. R., Overman, A. A. & Dennis, N. A (March 2021). Age-Related increases in associative false alarms: A representational similarity analysis of hits and misses at retrieval. Poster presented at Cognitive Neuroscience Society 2021.

6) Gerver, C. R., Overman, A. A., **Carpenter, C. M.,** Cowan, J., Jenkins, C. & Dennis, N. A (March 2021). Encoding-retrieval congruency affects the neural processing of associative recollection in young and older adults. Poster presented at the Cognitive Neuroscience Society 2021.

5) **Carpenter, C.** & Babu, H. (2020, April 9). The effect of memory cue duration on directed forgetting performance in healthy aging. Psi Chi Undergraduate Research Conference, State College, PA, United States (Conference cancelled due to COVID-19).

4) Babu, H. & **Carpenter, C.** (2020, April 9). Contextual interference negatively impacts associative memory across age. Psi Chi Undergraduate Research Conference, State College, PA, United States (Conference cancelled due to COVID-19).

3) **Carpenter, C.,** Babu, H., Kurkela, K., & Dennis, N. A. (2020). The effect of memory cue duration on directed forgetting performance in healthy aging. Poster to be presented at the Cognitive Aging Conference (Conference cancelled due to COVID-19)

2) Babu, H., **Carpenter, C.,** Webb, C., Overman, A., Dennis, N. A. (2020). Contextual interference negatively impacts associative memory across age. Poster to be presented at the Cognitive Aging Conference (Conference cancelled due to COVID-19)

1) Chamberlain, J., Hultman, C., Martinez, V., **Carpenter, C.**, Overman, A., Dennis, N. A. (2019). Configuration manipulation impacts neural patterns in medial temporal lobe in associative memory retrieval. Poster presented at the Cognitive Neuroscience Annual Meeting.

<u>Grants & Awards</u>

T32 NIH Aging Pathways Predoctoral Fellow   2023 - 2025
- Primary Advisor: Nancy Dennis
- Secondary Advisor: Janine Kwapis
- 2-year research fellowship integrating aging research from a psychological and biological perspective

University of Utah's Advanced Statistical Methods in Neuroimaging   2023
*   & Genetics Course Fellowship*
Mona Bird Shipley Memorial Scholarship – Honorable Mention   2019
Costello Family Memorial Scholarship in Psychology   2019
Liberal Arts Enrichment Funding   SU 2019- FA 2019
Dean's List   FA 2017 – SP 2020

<u>Teaching Experience – The Pennsylvania State University</u>

Teaching Assistant

Psych 490 – Debunking Myths about the Brain	FA 2020 & FA 2021
Psych 452 – Learning and Memory	FA 2020, 2022 & SP 2021
Psych 490 – False Memories	FA 2021
Psych 452 – Learning and Memory	FA 2022
Psych 490 – Happy and Healthy Brain	FA 2022
Psych 478 – Clinical Neuropsychology	SP 2023

Professional Memberships
- Cognitive Neuroscience Society   2020-current
- Psychonomic Society   2022-current

Leadership and Involvement
The Pennsylvania State University
- **Cognitive Area Graduate Liaison**   2022-current
- **Participants Across the Lifespan Database Graduate Coordinator**   2022-current
- **Invited Guest Panelist**   Fall 2022
  - Undergraduate Research Involvement talk

Software Proficiencies
MATLAB, R, Linux, CONN Toolbox, PsychoPy, Qualtrics, SPM12, FSL, fMRIprep, Microsoft Programs, E-Prime, SPSS, Pavlovia and Prolific