

**James E. Kragel**  
**Curriculum Vitae**  
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## Education

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**Vanderbilt University**

**Nashville, TN**

*Ph.D. in Neuroscience*

*August 2010 – August 2015*

Dissertation: *The functional neuroanatomy of episodic retrieval: using neuroimaging to understand the computational processes underlying human memory.*

**Advisor:** Sean M. Polyn

**Duke University**

**Durham, NC**

*BSE in Biomedical Engineering*

*August 2002 – December 2005*

## Academic Appointments

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**Center for the Study of the Mind, University of Chicago**

**Chicago, IL**

*Postdoctoral Scholar*

*September 2021 – current*

**Advisor:** Joel L. Voss

**Laboratory for Human Neuroscience, Northwestern University**

**Chicago, IL**

*Postdoctoral Research Fellow*

*June 2018 – September 2021*

**Advisors:** Joel L. Voss, Donna J. Bridge

**Computational Memory Lab, University of Pennsylvania**

**Philadelphia, PA**

*Postdoctoral Research Fellow*

*May 2015 – May 2018*

**Advisor:** Michael J. Kahana

**Center for Cognitive Neuroscience, Duke University**

**Durham, NC**

*Associate in Research*

*July 2006 – July 2010*

**Advisor:** Roberto Cabeza

## Publications

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### Refereed Publications

- [1] **J. E. Kragel** and J. L. Voss. Temporal context guides visual exploration during scene recognition. *Journal of Experimental Psychology: General*, 150(5):873–889, 2021.
- [2] **J. E. Kragel**, S. Schuele, S. VanHaerents, J. M. Rosenow, and J. L. Voss. Rapid coordination of effective learning by the human hippocampus. *Science Advances*, 7(25):eabf7144, 2021.
- [3] **J. E. Kragel**, Y. Ezzyat, B. C. Lega, M. R. Sperling, G. A. Worrell, R. E. Gross, B. C. Jobst, S. A. Sheth, K. A. Zaghloul, J. M. Stein, and M. J. Kahana. Distinct cortical systems reinstate the content and context of episodic memories. *Nature Communications*, 12(1):1–10, 2021.

- [4] M. Hebscher, **J. E. Kragel**, T. Kahnt, and J. L. Voss. Enhanced reinstatement of naturalistic event memories due to hippocampal-network-targeted stimulation. *Current Biology*, 2021.
- [5] **J. E. Kragel**, S. VanHaerents, J. W. Templer, S. Schuele, J. M. Rosenow, A. S. Nilakanthan, and D. J. Bridge. Hippocampal theta coordinates memory processing during visual exploration. *eLife*, 9:e52108, 2020.
- [6] G. Chaitanya, W. Hinds, **J. Kragel**, X. He, N. Sideman, Y. Ezzyat, M. R. Sperling, A. Sharan, and J. I. Tracy. Tonic resting state hubness supports high gamma activity defined verbal memory encoding network in epilepsy. *Neuroscience*, 425:194–216, 2020.
- [7] C. T. Weidemann\*, **J. E. Kragel\***, B. C. Lega, G. A. Worrell, M. R. Sperling, A. D. Sharan, B. C. Jobst, F. Khadjevand, K. A. Davis, P. A. Wanda, A. Kadel, D. S. Rizzuto, and M. J. Kahana. Neural activity reveals interactions between episodic and semantic memory systems during retrieval. *Journal of Experimental Psychology: General*, 148(1):1, 2019. **\*equal contribution.**
- [8] E. A. Solomon, **J. E. Kragel**, R. Gross, B. Lega, M. R. Sperling, G. Worrell, S. A. Sheth, K. A. Zaghloul, B. C. Jobst, J. M. Stein, S. R. Das, R. Gorniak, C. S. Inman, S. Seger, D. S. Rizzuto, and M. J. Kahana. Medial temporal lobe functional connectivity predicts stimulation-induced theta power. *Nature Communications*, 9(1):4437, 2018.
- [9] E. A. Solomon, **J. E. Kragel**, M. R. Sperling, A. Sharan, G. Worrell, M. Kucewicz, C. S. Inman, B. Lega, K. A. Davis, J. M. Stein, B. C. Jobst, K. A. Zaghloul, S. A. Sheth, D. S. Rizzuto, and M. J. Kahana. Widespread theta synchrony and high-frequency desynchronization underlies enhanced cognition. *Nature Communications*, 8(1):1704, 2017.
- [10] **J. E. Kragel**, Y. Ezzyat, M. R. Sperling, R. Gorniak, G. A. Worrell, B. M. Berry, C. Inman, J.-J. Lin, K. A. Davis, S. R. Das, J. M. Stein, B. C. Jobst, K. A. Zaghloul, S. A. Sheth, D. S. Rizzuto, and M. J. Kahana. Similar patterns of neural activity predict memory function during encoding and retrieval. *NeuroImage*, 155:60–71, 2017.
- [11] Y. Ezzyat, **J. E. Kragel**, J. F. Burke, D. F. Levy, A. Lyalenko, P. Wanda, L. O’Sullivan, K. B. Hurley, S. Busygin, I. Pedisich, M. R. Sperling, G. A. Worrell, M. T. Kucewicz, K. A. Davis, T. H. Lucas, C. S. Inman, B. C. Lega, B. C. Jobst, S. A. Sheth, K. Zaghloul, M. J. Jutras, J. M. Stein, S. R. Das, R. Gorniak, D. S. Rizzuto, and M. J. Kahana. Direct brain stimulation modulates encoding states and memory performance in humans. *Current Biology*, 27(9):1251–1258, 2017.
- [12] M. Moore, A. Iordan, Y. Hu, **J. Kragel**, S. Dolcos, and F. Dolcos. Localized or diffuse: the link between prefrontal cortex volume and cognitive reappraisal. *Social Cognitive and Affective Neuroscience*, 11(8):1317–1325, 2016.
- [13] **J. E. Kragel** and S. M. Polyn. Decoding episodic retrieval processes: Frontoparietal and medial temporal lobe contributions to free recall. *Journal of Cognitive Neuroscience*, 28(1):125–139, 2016.
- [14] **J. E. Kragel**, N. W. Morton, and S. M. Polyn. Neural activity in the medial temporal lobe reveals the fidelity of mental time travel. *Journal of Neuroscience*, 35(7):2914–2926, 2015.

- [15] **J. E. Kragel** and S. M. Polyn. Functional interactions between large-scale networks during memory search. *Cerebral Cortex*, 25(3):667–679, 2013.
- [16] F. Dolcos, A. D. Iordan, **J. Kragel**, J. Stokes, R. Campbell, G. McCarthy, and R. Cabeza. Neural correlates of opposing effects of emotional distraction on working memory and episodic memory: an event-related fmri investigation. *Frontiers in Psychology*, 4:293, 2013.
- [17] S. M. Polyn, **J. E. Kragel**, N. W. Morton, J. D. McCluey, and Z. D. Cohen. The neural dynamics of task context in free recall. *Neuropsychologia*, 50(4):447–457, 2012.
- [18] S. M. Hayes, N. Buchler, J. Stokes, **J. Kragel**, and R. Cabeza. Neural correlates of confidence during item recognition and source memory retrieval: evidence for both dual-process and strength memory theories. *Journal of Cognitive Neuroscience*, 23(12):3959–3971, 2011.
- [19] S. W. Davis, **J. E. Kragel**, D. J. Madden, and R. Cabeza. The architecture of cross-hemispheric communication in the aging brain: linking behavior to functional and structural connectivity. *Cerebral Cortex*, 22(1):232–242, 2011.
- [20] R. Cabeza, Y. S. Mazuz, J. Stokes, **J. E. Kragel**, M. G. Woldorff, E. Ciaramelli, I. R. Olson, and M. Moscovitch. Overlapping parietal activity in memory and perception: evidence for the attention to memory model. *Journal of Cognitive Neuroscience*, 23(11):3209–3217, 2011.
- [21] N. A. Dennis, A. C. Need, K. S. LaBar, S. Waters-Metenier, E. T. Cirulli, **J. Kragel**, D. B. Goldstein, and R. Cabeza. Comt val108/158 met genotype affects neural but not cognitive processing in healthy individuals. *Cerebral Cortex*, 20(3):672–683, 2009.

## Working Papers.....

- [1] **J. E. Kragel**, S. M. Lurie, M. J. Schatza, E. B. Blackwood, E. A. Chung, C. Zelano, S. U. Schuele, J. F. Disterhoft, A. S. Widge, and J. L. Voss. Theta synchronized stimulation increases hippocampal excitability in humans. *In preparation*.
- [2] **J. E. Kragel** and J. L. Voss. Looking for the neural basis of memory. *Trends in Cognitive Sciences*, Invited review.
- [3] S. M. Polyn, **J. Kragel**, J. D. McCluey, and J. F. Burke. Altering the flow of mental time: A test of retrieved-context theory. *PsyArXiv*, 2019.

## Spoken Presentations.....

- [1] **J. E. Kragel**, S. Schuele, S. VanHaerents, J. M. Rosenow, and J. L. Voss. The human hippocampus guides visual sampling based on the recent past to optimize learning. Online, 2021. The Cognitive Neuroscience Society Virtual Meeting.
- [2] **J. E. Kragel**, S. Schuele, S. VanHaerents, J. M. Rosenow, and J. L. Voss. Hippocampal theta oscillations rapidly map effective visual exploration. Philadelphia, PA, 2021. Context and Episodic Memory Symposium.

- [3] **J. E. Kragel** and J. L. Voss. Temporal context guides visual exploration during scene recognition. Online, 2020. Context and Episodic Memory Symposium.
- [4] **J. E. Kragel**, S. VanHaerents, J. W. Templer, S. Schuele, J. M. Rosenow, A. S. Nilakantan, and D. J. Bridge. Hippocampal theta coordinates memory processing during visual exploration. Austin, TX, 2019. Austin Conference on Learning and Memory, **\*Invited Poster Talk Award**.
- [5] C. T. Weidemann, **J. E. Kragel\***, B. C. Lega, G. A. Worrell, M. R. Sperling, A. D. Sharan, B. C. Jobst, F. Khadjevand, K. A. Davis, P. A. Wanda, A. Kadel, D. S. Rizzuto, and M. J. Kahana. Neural activity reveals interactions between episodic and semantic memory systems during retrieval. Philadelphia, PA, 2018. Context and Episodic Memory Symposium, **\*presenting author**.
- [6] **J. E. Kragel**, G. A. Worrell, M. R. Sperling, G. R. E, B. C. Lega, B. C. Jobst, S. A. Sheth, K. A. Zaghloul, J. M. Stein, and M. J. Kahana. Distinct cortical systems reinstate content and context information during memory search. San Diego, CA, 2018. Society for Neuroscience Abstracts.
- [7] S. M. Polyn and **J. E. Kragel\***. Dynamics of large-scale cortical networks reveal the cognitive control of episodic memory. Chicago, IL, 2016. Psychonomic Society annual meeting, **\*presenting author**.

#### Selected Posters.....

- [1] **J. E. Kragel**, S. M. Lurie, M. J. Schatza, E. B. Blackwood, E. A. Chung, C. Zelano, S. U. Schuele, J. F. Disterhoft, A. S. Widge, and J. L. Voss. Theta synchronized stimulation increases hippocampal excitability in humans. Chicago, IL, 2021. Society for Neuroscience Abstracts.
- [2] **J. E. Kragel**, S. M. Lurie, M. J. Schatza, E. B. Blackwood, E. A. Chung, C. Zelano, S. U. Schuele, J. F. Disterhoft, A. S. Widge, and J. L. Voss. Theta synchronized closed-loop stimulation increases hippocampal excitability in humans. Charleston, SC, 2021. 4th International Brain Stimulation Conference.
- [3] **J. E. Kragel** and J. L. Voss. Reinstated episodic context guides visual exploration during scene recognition. Online, 2020. The Cognitive Neuroscience Society Virtual Meeting.
- [4] **J. E. Kragel**, E. A. Solomon, P. A. Wanda, J. M. Stein, M. R. Sperling, A. Sharan, R. E. Gross, C. S. Inman, B. C. Lega, G. A. Worrell, B. C. Jobst, S. A. Sheth, D. S. Rizzuto, and M. J. Kahana. Functional networks constrain stimulation-evoked neural activity. Washington DC, 2017. Society for Neuroscience Abstracts.
- [5] **J. E. Kragel**, Y. Ezzyat, M. R. Sperling, R. Gorniak, G. A. Worrell, B. M. Berry, R. E. Gross, B. C. Lega, , K. Davis, S. R. Das, J. M. Stein, B. C. Jobst, K. A. Zaghloul, S. A. Sheth, D. S. Rizzuto, and M. J. Kahana. Intrinsic functional architecture of cortico-hippocampal networks determines episodic memory formation in humans. Philadelphia, PA, 2017. Context and Episodic Memory Symposium.

- [6] **J. E. Kragel**, Y. Ezzyat, J. F. Burke, J.-J. Lin, J. M. Stein, S. R. Das, R. Gorniak, R. E. Gross, K. A. Davis, M. R. Sperling, B. C. Jobst, S. A. Sheth, K. A. Zaghloul, G. A. Worrell, D. S. Rizzuto, and M. J. Kahana. Core episodic encoding and retrieval processes revealed by dynamics of oscillatory brain activity. San Diego, CA, 2016. Society for Neuroscience Abstracts.
- [7] **J. E. Kragel**, J. F. Burke, and M. J. Kahana. Core episodic encoding and retrieval processes revealed by dynamics of oscillatory brain activity. Philadelphia, PA, 2016. Context and Episodic Memory Symposium.
- [8] **J. E. Kragel** and S. M. Polyn. Large-scale network activity predicts the maintenance and retrieval of contextual information in memory. Philadelphia, PA, 2015. Context and Episodic Memory Symposium.
- [9] S. M. Polyn, **J. E. Kragel**, and N. W. Morton. Medial temporal lobe activity reflecting the precision of mental time travel. Long Beach, CA, 2014. Psychonomic Society annual meeting.
- [10] **J. E. Kragel** and S. M. Polyn. Activity within the default mode network predicts the organization of human memory. Philadelphia, PA, 2014. Context and Episodic Memory Symposium.
- [11] S. M. Polyn and **J. E. Kragel**. Incorporating neural signals into computational models of memory search. San Diego, CA, 2013. Society for Neuroscience Abstracts.

## Fellowships and Awards

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T32 fellowship, National Institute of Neurological Disorders and Stroke	2018 – 2020
Austin Conference on Learning and Memory, Invited Poster Talk Award	2019
NSF Graduate Research Fellowships Program, Honorable Mention	2010

## Teaching

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<b>PSY249, Special Topics:</b> Guest Lecturer, University of Pennsylvania	Fall 2017
<b>NSC235, Basis of Mental Disorders:</b> Teaching Assistant, Vanderbilt University	Fall 2014
<b>PSY253, Human Memory:</b> Teaching Assistant, Vanderbilt University	Fall 2013
<b>BME83, Biomaterials:</b> Teaching Assistant, Duke University	Spring 2004

## Student Advising

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Graduate Students.....	
<b>Sarah Lurie:</b> Northwestern University	2019 – current
<b>Aneesha Nilakantan:</b> Northwestern University	2018 – 2019
Undergraduate Students.....	
<b>Esther Chung:</b> Northwestern University	2020 – current
<b>Franco Bautista:</b> University of Pennsylvania	2017 – 2018

Jang Lim: University of Pennsylvania  
Richard Arriviello: Vanderbilt University

2016 – 2017  
2013 – 2014

## Open Science Contributions

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Data and code to reproduce results.....

Kragel et al. 2021, <i>Nature Communications</i> :	<a href="#">[paper]</a> <a href="#">[code]</a> <a href="#">[data]</a>
Kragel et al. 2021, <i>Science Advances</i> :	<a href="#">[paper]</a> <a href="#">[code]</a> <a href="#">[data]</a>
Kragel et al. 2020, <i>eLife</i> :	<a href="#">[paper]</a> <a href="#">[code]</a> <a href="#">[data]</a>
Kragel and Voss 2020, <i>JEP:G</i> :	<a href="#">[paper]</a> <a href="#">[data]</a> <a href="#">[data]</a>
Weidemann et al. 2019, <i>JEP:G</i> :	<a href="#">[paper]</a> <a href="#">[code]</a> <a href="#">[data]</a>
Solomon et al. 2018, <i>Nature Communications</i> :	<a href="#">[paper]</a> <a href="#">[code]</a>
Solomon et al. 2017, <i>Nature Communications</i> :	<a href="#">[paper]</a> <a href="#">[code]</a>

Open source analysis software.....

**pybeh:** <https://github.com/pennmem/pybeh>      *Python behavioral toolbox for free-recall analysis*

## Ad-Hoc Reviewing

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Behavioral Neuroscience	Journal of Neuroscience
Brain Stimulation	Learning and Memory
Cerebral Cortex*	NeuroImage
Cognition	PLoS Biology
Cognitive Affective and Behavioral Neuroscience	PLoS ONE
Journal of Cognitive Neuroscience	Psychological Review
Journal of Neurophysiology*	Science*

\*Assisted with review

## Professional Society Memberships

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Society for Neuroscience  
Psychonomic Society  
Cognitive Neuroscience Society

## References

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Joel L. Voss Department of Neurology University of Chicago <a href="mailto:joelvoss@uchicago.edu">joelvoss@uchicago.edu</a>	Michael J. Kahana Department of Psychology University of Pennsylvania (215) 746-3501 <a href="mailto:kahana@psych.upenn.edu">kahana@psych.upenn.edu</a>	Sean M. Polyn Department of Psychology Vanderbilt University (615) 322-2536 <a href="mailto:sean.polyn@vanderbilt.edu">sean.polyn@vanderbilt.edu</a>
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