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ACADEMIC APPOINTMENTS

Princeton Neuroscience Institute   *2020–Current*
Postdoctoral Research Associate   Princeton, NJ
Advisor: Nathaniel D. Daw, Ph.D.

EDUCATION

University of Pennsylvania   *2020*
Ph.D. in Neuroscience   Philadelphia, PA
Advisor: Danielle S. Bassett, Ph.D.
Thesis: Behavioral and Neural Correlates of Graph Learning

Tel Aviv University   *2012*
Research Assistant   Tel Aviv, Israel
Advisor: Matti Mintz, Ph.D.
Computational modeling of the cerebellar microcircuit for sequential learning

Washington University in St. Louis   *2011*
B.S. in Computer Science & Chinese   St. Louis, MO
Minor in Physics
Graduated with Engineering Honors, Cum Laude

PREPRINTS

Kate Nussenbaum, **Ari Kahn**, Alice Zhang, Nathaniel Daw, and Catherine Hartley (2025). "Shifts in Learning Dynamics Drive Developmental Improvements in the Acquisition of Structured Knowledge". In: PsyArXiv: `https://osf.io/preprints/psyarxiv/amvth_v1`.

Alice Zhang, **Ari Kahn**, Nathaniel Daw, Kate Nussenbaum, and Catherine Hartley (2025). "Children Leverage Predictive Representations for Flexible, Value-Guided Choice". In: PsyArXiv: `https://osf.io/preprints/psyarxiv/y3dzn_v2`.

Alison E. Comrie, Emily J. Monroe, **Ari E. Kahn**, Eric L. Denovellis, Abhilasha Joshi, Jennifer A. Guidera, Timothy A. Krausz, Joshua D. Berke, Nathaniel D. Daw, and Loren M. Frank (2024). "Hippocampal Representations of Alternative Possibilities Are Flexibly Generated to Meet Cognitive Demands". In: bioRxiv: `https://www.biorxiv.org/content/10.1101/2024.09.23.613567v1`.

Ari E. Kahn, Danielle S. Bassett, and Nathaniel D. Daw (2024). "Trial-by-Trial Learning of Successor Representations in Human Behavior". In: bioRxiv: `https://www.biorxiv.org/content/10.1101/2024.11.07.622528v2`.

Sophie Loman, Lorenzo Caciagli, **Ari E. Kahn**, Karol P. Szymula, Nathaniel Nyema, and Dani S. Bassett (2024). "Time-Resolved Functional Connectivity during Visuomotor Graph Learning". In: bioRxiv: `https://www.biorxiv.org/content/10.1101/2024.07.04.602005v1`.

PUBLICATIONS

Ari E. Kahn and Nathaniel D. Daw (2025). "Humans Rationally Balance Detailed and Temporally Abstract World Models". In: *Communications Psychology* 3.1, pp. 1–11.

Ari E. Kahn, Karol Szymula, Sophie Loman, Edda B. Haggerty, Nathaniel Nyema, Geoffrey K. Aguirre, and Dani S. Bassett (2025). "Network Structure Influences the Strength of Learned Neural Representations". In: *Nature Communications* 16.1, p. 994.

Marie-Constance Corsi, Pierpaolo Sorrentino, Denis Schwartz, Nathalie George, Leonardo L. Gollo, Sylvain Chevallier, Laurent Hugueville, **Ari E. Kahn**, Sophie Dupont, Danielle S. Bassett, Viktor Jirsa, and Fabrizio De Vico Fallani (2024). "Measuring Neuronal Avalanches to Inform Brain-Computer Interfaces". In: *iScience* 27.1, p. 108734.

Xiaohuan Xia, Andrei A. Klishin, Jennifer Stiso, Christopher W. Lynn, **Ari E. Kahn**, Lorenzo Caciagli, and Dani S. Bassett (2024). "Human Learning of Hierarchical Graphs". In: *Physical Review E* 109.4, p. 044305.

Timothy A. Krausz, Alison E. Comrie, **Ari E. Kahn**, Loren M. Frank, Nathaniel D. Daw, and Joshua D. Berke (2023). "Dual Credit Assignment Processes Underlie Dopamine Signals in a Complex Spatial Environment". In: *Neuron* 111.21, 3465–3478.e7. pmid: 37611585.

Arun S. Mahadevan, Eli J. Cornblath, David M. Lydon-Staley, Dale Zhou, Linden Parkes, Bart Larsen, Azeez Adebimpe, **Ari E. Kahn**, Ruben C. Gur, Raquel E. Gur, Theodore D. Satterthwaite, Daniel H. Wolf, and Dani S. Bassett (2023). "Alprazolam Modulates Persistence Energy during Emotion Processing in First-Degree Relatives of Individuals with Schizophrenia: A Network Control Study". In: *Molecular Psychiatry*, pp. 1–10.

Jennifer Stiso, Christopher W. Lynn, **Ari E. Kahn**, Vinitha Rangarajan, Karol P. Szymula, Ryan Archer, Andrew Revell, Joel M. Stein, Brian Litt, Kathryn A. Davis, Timothy H. Lucas, and Dani S. Bassett (2022). "Neurophysiological Evidence for Cognitive Map Formation during Sequence Learning". In: *eNeuro* 9.2, ENEURO.0361–21.2022. pmid: 35105662.

Marie-Constance Corsi, Mario Chavez, Denis Schwartz, Nathalie George, Laurent Hugueville, **Ari E. Kahn**, Sophie Dupont, Danielle S. Bassett, and Fabrizio De Vico Fallani (2021). "BCI Learning Induces Core-Periphery Reorganization in M/EEG Multiplex Brain Networks". In: *Journal of Neural Engineering*.

Marie-Constance Corsi, Mario Chavez, Denis Schwartz, Nathalie George, Laurent Hugueville, **Ari E. Kahn**, Sophie Dupont, Danielle S. Bassett, and Fabrizio De Vico Fallani (2020). "Functional Disconnection of Associative Cortical Areas Predicts Performance during BCI Training". In: *NeuroImage*, p. 116500.

Teresa M. Karrer, Jason Z. Kim, Jennifer Stiso, **Ari E. Kahn**, Fabio Pasqualetti, Ute Habel, and Danielle S. Bassett (2020). "A Practical Guide to Methodological Considerations in the Controllability of Structural Brain Networks". In: *Journal of Neural Engineering* 17.2, p. 026031.

Christopher W. Lynn, **Ari E. Kahn**, Nathaniel Nyema, and Danielle S. Bassett (2020). "Abstract Representations of Events Arise from Mental Errors in Learning and Memory". In: *Nature Communications* 11.1 (1), p. 2313.

Christopher W. Lynn, Lia Papadopoulos, **Ari E. Kahn**, and Danielle S. Bassett (2020). "Human Information Processing in Complex Networks". In: *Nature Physics*, pp. 1–9.

Steven H. Tompson, **Ari E. Kahn**, Emily B. Falk, Jean M. Vettel, and Danielle S. Bassett (2020). "Functional Brain Network Architecture Supporting the Learning of Social Networks in Humans". In: *NeuroImage*, p. 116498.

Richard F. Betzel, John D. Medaglia, **Ari E. Kahn**, Jonathan Soffer, Daniel R. Schonhaut, and Danielle S. Bassett (2019). "Structural, Geometric and Genetic Factors Predict Interregional Brain Connectivity Patterns Probed by Electrocorticography". In: *Nature Biomedical Engineering* 3.11, pp. 902–916.

Elisabeth A. Karuza, **Ari E. Kahn**, and Danielle S. Bassett (2019). "Human Sensitivity to Community Structure Is Robust to Topological Variation". In: *Complexity* 2019, pp. 1–8.

Ankit N. Khambhati, **Ari E. Kahn**, Julia Costantini, Youssef Ezzyat, Ethan A. Solomon, Robert E. Gross, Barbara C. Jobst, Sameer A. Sheth, Kareem A. Zaghloul, Gregory Worrell, Sarah Seger, Bradley C. Lega, Shennan Weiss, Michael R. Sperling, Richard Gorniak, Sandhitsu R. Das, Joel M. Stein, Daniel S. Rizzuto, Michael J. Kahana, Timothy H. Lucas, Kathryn A. Davis, Joseph I. Tracy, and Danielle S. Bassett (2019). "Functional Control of Electrophysiological Network Architecture Using Direct Neurostimulation in Humans". In: *Network Neuroscience*, pp. 1–30.

Jennifer Stiso, Ankit N. Khambhati, Tommaso Menara, **Ari E. Kahn**, Joel M. Stein, Sandihitsu R. Das, Richard Gorniak, Joseph Tracy, Brian Litt, Kathryn A. Davis, Fabio Pasqualetti, Timothy H. Lucas, and Danielle S. Bassett (2019). "White Matter Network Architecture Guides Direct Electrical Stimulation through Optimal State Transitions". In: *Cell Reports* 28.10, 2554–2566.e7.

Steven H. Tompson, **Ari E. Kahn**, Emily B. Falk, Jean M. Vettel, and Danielle S. Bassett (2019). "Individual Differences in Learning Social and Nonsocial Network Structures". In: *Journal of Experimental Psychology: Learning, Memory, and Cognition* 45.2, pp. 253–271.

Ari E. Kahn, Elisabeth A. Karuza, Jean M. Vettel, and Danielle S. Bassett (2018). "Network Constraints on Learnability of Probabilistic Motor Sequences". In: *Nature Human Behaviour* 2.12, pp. 936–947.

Jason Z. Kim, Jonathan M. Soffer, **Ari E. Kahn**, Jean M. Vettel, Fabio Pasqualetti, and Danielle S. Bassett (2018). "Role of Graph Architecture in Controlling Dynamical Networks with Applications to Neural Systems". In: *Nature Physics* 14.1, pp. 91–98.

Ann E. Sizemore, Chad Giusti, **Ari Kahn**, Jean M. Vettel, Richard F. Betzel, and Danielle S. Bassett (2018). "Cliques and Cavities in the Human Connectome". In: *Journal of Computational Neuroscience* 44.1, pp. 115–145.

Graham L. Baum, Rastko Ciric, David R. Roalf, Richard F. Betzel, Tyler M. Moore, Russell T. Shinohara, **Ari E. Kahn**, Simon N. Vandekar, Petra E. Rupert, Megan Quarmley, Philip A. Cook, Mark A. Elliott, Kosha Ruparel, Raquel E. Gur, Ruben C. Gur, Danielle S. Bassett, and Theodore D. Satterthwaite (2017). "Modular Segregation of Structural Brain Networks Supports the Development of Executive Function in Youth". In: *Current Biology* 27.11, 1561–1572.e8. pmid: 28552358.

Ari E. Kahn, Marcelo G. Mattar, Jean M. Vettel, Nicholas F. Wymbs, Scott T. Grafton, and Danielle S. Bassett (2017). "Structural Pathways Supporting Swift Acquisition of New Visuomotor Skills". In: *Cerebral Cortex* 27.1, pp. 173–184.

Elisabeth A. Karuza, **Ari E. Kahn**, Sharon L. Thompson-Schill, and Danielle S. Bassett (2017). "Process Reveals Structure: How a Network Is Traversed Mediates Expectations about Its Architecture". In: *Scientific Reports* 7.1, p. 12733.

Evelyn Tang, Chad Giusti, Graham L. Baum, Shi Gu, Eli Pollock, **Ari E. Kahn**, David R. Roalf, Tyler M. Moore, Kosha Ruparel, Ruben C. Gur, Raquel E. Gur, Theodore D. Satterthwaite, and Danielle S. Bassett (2017). "Developmental Increases in White Matter Network Controllability Support a Growing Diversity of Brain Dynamics". In: *Nature Communications* 8.1, p. 1252.

Shi Gu, Fabio Pasqualetti, Matthew Cieslak, Qawi K. Telesford, Alfred B. Yu, **Ari E. Kahn**, John D. Medaglia, Jean M. Vettel, Michael B. Miller, Scott T. Grafton, and Danielle S. Bassett (2015). "Controllability of Structural Brain Networks". In: *Nature Communications* 6, p. 8414.

POSTERS

Kate Nussenbaum, Alice Zhang, **Ari Kahn** Nathaniel Daw, & Catherine Hartley. "Children leverage predictive representations for reward-guided choice", Flux. September 27–30, 2024, Baltimore, Maryland, USA.

Ari Kahn, Dani Bassett, Nathaniel Daw. "Human Behavior is Best Predicted by a Successor Representation Learning Rule", Cognitive Computataional Neuroscience. August 6–9, 2024, Cambridge, Massachusetts, USA.

Xulu Sun et al. "Dynamic value codes in the medial prefrontal cortex to inform decision-making", Cosyne. August 6–9, 2024, Lisbon, Portugal.

Dani Bassett, **Ari Kahn**, Sophie Loman. "Event Graph Structure Determines Fidelity of Neural Representations", AREADNE. June 25–29, 2024, Milos, Greece.

Alison Comrie et al. "Dynamic engagement of non-local spatial representations in the hippocampus during value-guided foraging decisions". Society for Neuroscience. October 5–9, 2023, Chicago, Illinois, USA

Tim Krausz, Alison Comrie, **Ari Kahn**, Loren Frank, Nathaniel Daw, & Josh Berke. "Dopamine value signals propagate through space during foraging". Society for Neuroscience. November 11–15, 2022, Washington, DC, USA

Ari Kahn Nathaniel Daw. "Measuring Behavioral Arbitration of the Successor Representation". Cognitive Computataional Neuroscience. August 25–28, 2022, San Francisco, California, USA.

Ari Kahn Nathaniel Daw. "Measuring Behavioral Arbitration of the Successor Representation". PNI Retreat. May 2–3, 2022, Vernon Township, New Jersey, USA.

Ari Kahn, Elisabeth Karuza, Jean Vettel & Danielle Bassett. "Network constraints on learnability of probabilistic motor sequences", Interdisciplinary Advances in Statistical Learning. June 27–29, 2019, San Sebastian, Spain.

Ari Kahn, Elisabeth Karuza, Jean Vettel & Danielle Bassett. "Network constraints on learnability of probabilistic motor sequences", Sackler Colloquium "Brain Produces Mind by Modeling". May 1–3, 2019, Irvine, California, USA.

MINS Symposium. April 3, 2019, Philadelphia, Pennsylvania, USA.

Steve Tompson, **Ari Kahn**, Emily Falk, Jean Vettel, & Dani Bassett. "Functional brain network architecture supporting the learning of social versus non-social networks", Society for Neuroscience. November 3–7, San Deigo, California, USA.

Jeni Stiso et al. "White matter network architecture guides direct electrical stimulation through optimal state transitions", Society for Neuroscience. November 3–7, San Deigo, California, USA.

Daniel Schonhaut, **Ari Kahn**, Rick Betzel, & Dani Bassett. "Gene co-expression patterns underlie cognitive process divisions of human neocortex", Society for Neuroscience. November 11–15, 2017, Washington, DC, USA.

Ari Kahn, Marcelo Mattar, Jean Vettel, Nick Wymbs, Scott Grafton, & Danielle Bassett. "Structural correlates of individual differences in motor sequence learning", Society for Neuroscience. November 12–16, 2016, San Deigo, California, USA.

Ari Kahn, Elisabeth Karuza, Jean Vettel & Danielle Bassett. "Network constraints on learnability of probabilistic motor sequences", Conference on Computataional Neuroscience. September 5–8, 2018, Philadelphia, Pennsylvania, USA.

Elisabeth Karuza, **Ari Kahn**, Jean Vettel & Danielle Bassett. "Process reveals structure: How a network is traversed mediates expectations about its architecture", Psychonomics. November 17–20, 2016, Boston, Massachusetts, USA.

Ari Kahn, Marcelo Mattar, Jean Vettel, Nick Wymbs, Scott Grafton, & Danielle Bassett. "Structural correlates of individual differences in motor sequence learning", Society for Neuroscience. November 12–16, 2016, San Deigo, California, USA.

Graham Baum et al. "Modular evolution of structural brain networks in adolescence supports executive function and is impacted by socioeconomic status", Society for Neuroscience. November 12–16, 2016, San Deigo, California, USA.

Evelyn Tang et al. "White matter connectivity supports increasing diversity of neural dynamics across normative neurodevelopment", Society for Neuroscience. November 12–16, 2016, San Deigo, California, USA.

Ari Kahn, Marcelo Mattar, Jean Vettel, Nick Wymbs, Scott Grafton, & Danielle Bassett. "Structural Predictors of Individual Differences in Motor Sequence Learning", ARL. November 2015.

Ari Kahn, Arie Magal, Roni Hogri, Matti Mintz. "Cerebellar motor sequence acquisition: A computational study", Society for Neuroscience. October 13–17, 2012, New Orleans, Louisiana, USA.

TALKS

Concats, NYU, 2025

Computational Perception and Cognition Laboratory, University of Pennsylvania (PI: Alan Stocker), 2025

PDP Seminar, Princeton University, 2024

Computational Cognitive Neuroscience Laboratory, UC Irvine (PI: Aaron Bornstein), 2023

Frank Laboratory, UCSF (PI: Loren Frank), 2022

PDP Seminar, Princeton University, 2022

PDP Seminar, Princeton University, 2019

Interdisciplinary Advances in Statistical Learning. June 27–29, 2019, San Sebastian, Spain.

CompleNet. March 4–8, 2018, Boston, Massachusetts, USA.

SIAM Workshop on Network Science. July 12–13, 2018, Portland, Oregon, USA.

AWARDS

Sackler Colloquium "Brain Produces Mind by Modeling" Travel Award	*Spring 2019*
SIAM Student Travel Award	*Spring 2018*
Jameson-Hurvich Travel Award	*Fall 2016*

TEACHING AND MENTORING

Undergraduate Mentoring
Erin Chang   *2024 – Current*
Supervising senior thesis, neural data analysis

Nathaniel Nyema   *2018 – 2020*
Mentoring on behavioral experiments and data analysis

Teaching Assistant
Introduction to Brain and Behavior   *Spring 2016*
Led weekly undergraduate recitation section and wrote testing material

OUTREACH

Upward Bound
Summer Neuroscience Elective
Head Coordinator   *2016–2018*
Instructor   *2014–2015*

Penn Neuroscience Public Lecture Series
Committee Member   *2014–2017*

Neuroscience Elementary School Outreach Program
Instructor   *2013–2017*

PROFESSIONAL AFFILIATIONS

Society for Neuroscience

SIAM