Abhilasha A. Kumar

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Academic Appointments

Assistant Professor, Psychology — 2022 - present
Bowdoin College, ME

Postdoctoral Research Associate — 2021 - 2022
Indiana University, Bloomington, IN

Education

Ph.D. in Psychological & Brain Sciences — 2021
Washington University in St. Louis, MO

M.A. in Psychological & Brain Sciences — 2018
Washington University in St. Louis, MO

M.A. in Liberal Arts (Computer Science and Psychology) — 2016
Ashoka University, India

Integrated M. Tech in Mathematics & Computing — 2014
IIT Delhi, India

External Funding

"Modeling Search within the Mental Lexicon" (PI; NSF: BCS-PAC; $559,676) — 2023-26
Collaborative Grant w/ Michael Jones, Indiana University

Internal Funding

Faculty Research Award — 2023
Bowdoin College, $3,635

Course Enrichment Awards — 2022-23
Bowdoin College, $1600

Monthly mini grants — 2023
Bowdoin College, $2000

Peer-Reviewed Publications

shared authorship, theoretical review, undergraduate author, conference paper

18. **Kumar, A.A.**, Apsel, M., Zhang, L., Xing, N., Jones. M.N. (under review). forager: A Python package and web interface for modeling memory search.
17. **Kumar, A.A.**, Steyers, M. (2023). Help me help you: A computational model for goal inference and action planning. In *Proceedings of the 45th Annual Meeting of the Cognitive Science Society*.

16. Coretta, S., Casillas, J. V., Roessig, S., Franke, M., Ahn, B., Al-Hoorie, A. H., ... **Kumar, A.A.**,... & Wood, A. (2023). Multidimensional signals and analytic flexibility: Estimating degrees of freedom in human speech analyses. *Advances in Methods and Practices in Psychological Sciences*.
15. **Kumar, A.A.**, Lundin, N. B., Jones, M.N. (2022). Mouse-mole-vole: The inconspicuous benefits of phonology during retrieval from semantic memory. In *Proceedings of the 44th Annual Meeting of the Cognitive Science Society*.
14. Apsel, M., **Kumar, A.A.**, Jones, M.N. (2022). Finding the right words: A computational model of cued lexical retrieval. In *Proceedings of the 44th Annual Meeting of the Cognitive Science Society*.
13. Kovacs, C.J., Wilson, J., **Kumar, A.A.** (2022). Fast and frugal memory search for communication. In *Proceedings of the 44th Annual Meeting of the Cognitive Science Society*.
12. **Kumar, A.A.**, Steyvers, M., Balota, D.A. (2021). Semantic memory search and retrieval in a novel cooperative word game: A comparison of associative and distributional semantic models. *Cognitive Science*, *45*(10), e13053.
11. **Kumar, A.A.**, Garg. K., Hawkins, R.D. (2021). Contextual flexibility guides efficient communication in a cooperative word game. In *Proceedings of the 43rd Annual Meeting of the Cognitive Science Society*.
10. **Kumar, A.A.**, Balota, A., Steyvers, M. (2021). A critical review of network-based and distributional approaches to semantic memory structure and processes. Invited Special Issue, *Topics in Cognitive Science*.
9. **Kumar, A.A.** (2021). Semantic memory: A review of methods, models, and current challenges. *Psychonomic Bulletin & Review*, *28*, pp. 40-80.
8. **Kumar, A. A.** (2021). Modeling semantic structure and spreading activation in retrieval tasks [Doctoral dissertation]. Washington University in St. Louis. *ProQuest Dissertations Publishing*. DOI https://doi.org/10.7936/7784-n595
7. **Kumar, A.A.**, Balota, D.A., De Deyne, S. (2020). Modeling free associations using distributional semantic models and spreading activation. *Grace Hopper Conference*.
6. **Kumar, A.A.**, Balota, D.A., Steyvers, M. (2020). Distant connectivity and multiple-step priming in large-scale semantic networks. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *46* (12), pp. 2261-2276.
5. **Kumar, A.A.**, Balota, D.A. (2020). Attempted prime retrieval is a double-edged sword: facilitation and disruption in repeated lexical retrieval. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *46*(8), 1505–1532.
4. **Kumar, A.A.**, Balota, D.A., Steyvers, M. (2019). Distant concept connectivity in network-based and spatial word representations. In *Proceedings of the 41st Annual Meeting of the Cognitive Science Society*, 1348-1354.
3. **Kumar, A.A.**, Balota, D.A., Habbert, J., Scaltritti, M., Maddox, G.B. (2019). Converging semantic and phonological information in lexical retrieval and selection in young and older adults. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 45(12), 2267–

2289.

2. **Kumar, A.A.**, Hangal, S., Rosen, A.C. (2019). Autobiographical recall of personally familiar names and temporal information in e-mails: an automatic analytic approach using e-mail communications. *Behavior Research Methods*, *51*(4), 1510-1530.

1. Maddox, G.B., Balota, D.A., **Kumar, A.A.**, Millar, P., Churchill, L. (2019). The immediate benefits and long-term costs of briefly presented primes on episodic recollection. *Journal of Memory and Language*. *106*, 77-94.

Manuscripts in Progress

4. Sides, J. , **Kumar, A.A.** (in prep.). Object-state changes: A replication and extension.
3. **Kumar, A.A.**, Willits, J., Kronenberger, W.G., Rammell, S., Pisoni, D., Jones, M.N. (in prep.). Semantic search and retrieval in populations with cochlear implants.
2. Mazzuchi, T. , Xing, N. , Hawkins, R.D., **Kumar, A.A.** (in prep.). A random walk-based model of pragmatic memory search.
1. **Kumar, A.A.**, Jones, M.N., Balota, D.A. (in prep.). An integrated representation and process modeling approach to semantic tasks.

Teaching and Mentoring Experience

Instructor, Bowdoin College
Cognition: Methods and Models, Spring 2023
Laboratory in Cognitive Science, Fall 2022
Intelligent Minds and Machines, Fall 2022

Guest Lecturer, Washington University in St. Louis
Hierarchical Linear Models, Spring 2019 (Generalized Hierarchical Linear Models)
Hierarchical Linear Models, Spring 2019 (Three-level Hierarchical Linear Models)
Methods in Linguistics Research, Fall 2018 (Introduction to Data Visualization in R)
Introduction to Computational Linguistics, Spring 2018 (Statistical Methods in Linguistics)
Introduction to Psychological Statistics, Spring 2018 (Confidence Intervals and t-tests)
Introduction to Psychology, Fall 2017 (Memory Distortions and Failures)

Assistant to the Instructor, Washington University in St. Louis
Psychology of Language (undergraduate-level class), 2020
- Supervised 20+ student projects on language acquisition, semantic models, and speech

Hierarchical Linear Models (graduate-level class), 2019
- Created R modules on advanced plotting and constructing complex contrast matrices

Methods in Linguistics Research (undergraduate-level class), 2018
- Lectured class of 20+ students on plotting in R; advised students on analysis and research

Introduction to Psychological Statistics (undergraduate-level class), 2018
- Advised class of 100+ students on coding-based/statistical projects and assignments

Introduction to Psychology (undergraduate-level class), 2017
- Lectured class of 100+ students on false memory and eyewitness testimony

Research Mentoring, Washington University in St. Louis
Students and Teachers as Research Scientists (STARS program, high-school students), 2017

- Mentored 2 high-school students in conducting independent research projects

Cognitive Psychology Lab: 15+ undergraduates (research mentoring), 2016-present

- Developed manuals on introductory statistics, experimental software, & analysis protocols
- Trained students to recruit participants, analyze experimental data, and present papers

Teaching Assistant, Ashoka University, India

Probability, Statistics & Data Science (undergraduate-level class), 2016
Human-Computer Interaction (undergraduate-level class), 2015
Mathematical Thinking (undergraduate-level class), 2014

Tutoring

Knowledge is Power Program (KIPP) Victory Academy, St. Louis, Jan-Mar 2020
Learning Lodge Program, Washington University in St. Louis, May 2020
National Service Scheme, IIT Delhi, 2009-2016

Professional Development in Teaching Program, 2016-2020

Completed a formalized training program in pedagogy involving 3 mentored experiences
Attended advanced workshops on effective evidence-based teaching practices:
Philosophy and Implementation of Collaborative Learning, January 2020
Applying Cognitive Science to Improve Teaching, April 2019
Providing Verbal Feedback to Students, February 2019
Who's in Charge Here? Strategies for Managing a Classroom, August 2017

Presentations

Invited talks

"Assistance and social inference", June 2023 (upcoming), *Computational Cognitive Science Lab, Princeton University*

"Integrating models of search and communication", August 2023 (upcoming), *National University of Singapore*

"Modeling search, communication, and cooperation", April 2023, *Department of Psychology, Claremont McKenna College*

"Search and communication within the mental lexicon", November 2022, *Colby College*.

"Careers in cognitive science", *Ashoka University CogSci Alumni Session,* June 2022, Virtual.

"Fostering international student participation in cognitive science", *International Cognitive Science Affinity Group, 43rd Annual Meeting of the Cognitive Science Society*, July 2021, Virtual.

"Computational models of semantic memory representation, search, and retrieval". *Indiana University*, April 2021, Virtual.

"Semantic memory: Representation, search, and retrieval". *Bowdoin College*, November 2020, Virtual.

"Computational models of semantic memory". The Stanford Language and Cognition Lab, *Stanford University*, September 2020, Virtual.

"Combining structure and process models of semantic memory". Computational Behavioral Science Lab. University of Pennsylvania, October 2020, Virtual.

Conference talks

"Mouse-mole-vole: The inconspicuous benefits of phonology during retrieval from semantic memory", *44th Annual Meeting of the Cognitive Science Society*, July 2022, Toronto.

"Language Games: A Window into Complex Cognition". *Games for Intelligence Workshop*, 43rd

Annual Meeting of the Cognitive Science Society, July 2021, Virtual.

"Understanding Human Language using Games and Machines". *Skype a Scientist Program*, September 2021, Virtual.

"Priming for Distant Concepts: Insights from Semantic Networks". Behavior, Brain, and Cognition Brownbag, *Washington University in St. Louis*, October 2019, St. Louis, MO.

"What's in an Abstract?". Institute for Public Health Summer Research Program, *Washington University in St. Louis*. June 2019, St. Louis, MO.

"Distant Connectivity in three 5000-word Semantic Networks in English". *Midwestern Psychological Association*, April 2019, Chicago, IL.

"Lexical Retrieval Inhibition from Semantically Related Retrieval Primes", Aging and Development Brownbag, *Washington University in St. Louis*, December 2018, St. Louis, MO.

"That Word at the Tip of Your Tongue". Public Health and Aging Session, *McDonnell Academy 7th International Symposium*, October 2018, Beijing, China.

"Network Path Length as a Measure of Semantic Distance in a 5000-word English Lexicon", Data Blitz, *Show Me State Conference on Cognition*, May 2018, St. Louis, MO.

"Remembering Names from Emails: Cognitive Experiments with Life-Logs (CELL): A Novel Approach to Study Name Retrieval", *Personal Digital Archiving Conference*, March 2017, Stanford University, Palo Alto, CA

"Cognitive Experiments on Life-Logs (CELL): A New Approach to Study Recall of Personally Familiar Proper-Names using Emails", *International Conference on Memory*, July 2016, Budapest, Hungary.

Posters

Apsel, M., **Kumar, A.A.**, Jones, M.N. (July 2022). Finding the right words: A computational model of cued lexical retrieval. *44th Annual Meeting of the Cognitive Science Society*, July 2022, Toronto.

Kumar, A.A. (November 2021). Probing Memory Representations through an Interactive Language Game, *Trends in Psychology Summit 2021*, Virtual.

Kumar, A.A., Balota, D.A., (November 2021). Modeling Distributional Structure and Spreading Activation in Retrieval Tasks, *Psychonomic Society 62nd Annual Meeting*, *Psychonomic Society*, Virtual.

Kumar, A.A., Balota, D.A., (November 2020). Searching Semantic Memory for Conceptual Associates, *Psychonomic Society 61st Annual Meeting, Psychonomic Society*, Virtual.

Kumar, A.A., Balota, D.A., Steyvers, M. (November 2019). Evaluating Association Networks and Distributional Semantic Models in a Cooperative Word Game, *Psychonomic Society 60th Annual Meeting, Psychonomic Society*, Montreal, Canada.

Albertina, E., **Kumar, A.A.**, Balota, D.A. (April 2019). Comparing Semantic Models using a Cooperative Word Game. *Undergraduate Research Symposium, Washington University in St. Louis*, MO.

Mutchler, Z., **Kumar, A.A.**, Balota, D.A. (April 2019). The Benefits and Costs of Repeated Retrieval from Semantic Memory. *Undergraduate Research Symposium, Washington University in St. Louis*, MO.

Kumar, A.A., Balota, D.A., Steyvers, M. (November 2018). Distant Semantic Network Connectivity and Semantic Priming: Evidence from a 5000-word Semantic Network*, Psychonomic Society 59th Annual Meeting, Psychonomic Society*, New Orleans, LA.

Albertina, E., **Kumar, A.A.**, Balota, D.A. (October 2018). Investigating Network Connectivity for Distant Concepts using a 5000-word Semantic Network in English. *Undergraduate Research Symposium, Washington University in St. Louis*, MO.

Steiner, R., **Kumar, A.A.**, Balota, D.A. (May 2018). Effects of Priming on Immediate and Delayed Episodic Memory Retrieval. *Mind, Brain, and Behavior Symposium, Washington University in St. Louis*, MO.

Kumar, A.A., Balota, D.A. (May 2018). Prime Retrieval Failure Disrupts Lexical Retrieval to Definitions in Younger and Older Adults, *2018 Cognitive Aging Conference*, Atlanta, GA.

Kumar, A.A., Balota, D.A., Habbert, J., Scaltritti, M., Maddox, G.B. (November 2017). Priming Lexical Retrieval to Definitions in Younger and Older Adults, *Psychonomic Society 58th Annual Meeting, Psychonomic Society*, Vancouver, British Columbia, Canada.

Kumar, A.A., Hangal, S., Piratla, V., Rosen, A.C. (July 2017). Whom Did I Send This Message To: An Automatic Analytic Approach to 59000 Email Communications, *2017 Leading Edge Workshop: Beyond the Lab: Using Big Data to Discover Principles of Cognition, Psychonomic Society*, Madison, WI.

Fellowships and Awards

Graduate Student Conference Award 2021
62nd Annual Meeting of the Psychonomic Society

Diverse Intelligences Summer Fellowship, UCLA 2020
Templeton World Charity Foundation

Outstanding Assistant to the Instructor Award 2019
Washington University in St. Louis, MO

Graduate Certificate in Quantitative Data Analysis 2019
Washington University in St. Louis, MO

Three Minute Thesis Winner and Finalist 2018, 2019
Washington University in St. Louis, MO
McDonnell International Symposium, Beijing, China

Technical Experience

NLP Research Scientist Intern, Capacity, St. Louis, Oct.-Dec. 2019
Finetuned language model on customer queries to improve question-answering system
Identified semantic features in queries that optimally represent conversation gist

Relevant Courses
Natural Language Processing (NLP) Specialization, deeplearning.ai
- Developed NLP-based autocorrect, autocomplete, and part-of-speech tagging algorithms

Deep Learning Specialization, deeplearning.ai
- Built shallow and deep neural networks for computer vision applications

Machine Learning, Washington University in St. Louis
- Implemented decision trees, random forests, & boosting algorithms for classification problems

Multivariate Analysis; Hierarchical Linear Models, Washington University in St. Louis
- Applied linear mixed effects models, clustering, and factor analysis to psychological data

Analytical and Technical Skills

Programming Experience: R, Python, MATLAB, HTML/CSS, JavaScript
Experimental Platforms: Psychopy, jsPsych, nodeGame, Qualtrics, E-Prime, Collector
Qualitative Research Methods: Individual/group interviews, observation, think-aloud protocols
Quantitative Research Methods: Survey design/sampling, hypothesis testing, online experiments
Modeling Experience: Word embedding algorithms, sentiment analysis, foraging/random walk models, network analysis, machine learning

Professional Service and Affiliations

Committees: International Committee (Cognitive Science Society), Conference Committee (Cognitive Science Society); International Affinity Group Committee (Cognitive Science Society)
Ad hoc Reviewer: Nature Reviews Psychology; Communications Psychology; Cognitive Science; Cognitive Science Society Annual Conference Proceedings; Journal of Experimental Psychology: General; Psychological Science; Journal of Experimental Psychology: Learning, Memory, and Cognition; Topics in Cognitive Science; Psychological Review; Journal of Memory and Language; Behavior Research Methods; Frontiers in Artificial Intelligence; Psychological Research; Acta Psychologica
Member: Cognitive Science Society (CSS); Psychonomic Society; Women in Cognitive Science (WiCS); Women in Network Science (WiNS); Graduate Women in Science