

Aedan Yue Li, Ph.D.

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SUMMARY

RESEARCH INTERESTS:

- Memory & perception, multimodal integration, representation, reasoning, consciousness

TECHNICAL SKILLS:

- Languages & Data analysis: MATLAB, R, Python, Bash, JASP, SQL
- Statistics: GLMs, Bayesian statistics, linear mixed models, mixture models, machine learning
- Research methods: Neuroimaging (multi-echo fMRI, MVPA), survey, behavioral, and online testing

TEACHING EXPERIENCE:

- Most recently taught a 3rd year Human Memory course in-person; previously taught undergraduate courses with 22 to 400+ students
 - 5+ years teaching experience in statistics, cognitive psychology, and cognitive neuroscience
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EDUCATION & TRAINING

BrainsCAN Postdoctoral Fellow, Computational Core **2023 – Present**
Western University – Advisors: Marieke Mur, John Paul Minda

Ph.D. Psychology (Cognitive Neuroscience) **2017 – 2023**
University of Toronto (cGPA: 4.00/4.00) – Advisor: Morgan D. Barense
Committee Members: Morgan D. Barense, Dirk Bernhardt-Walther, Keisuke Fukuda
Dissertation: “[A Solution to the Multimodal Binding Problem](https://hdl.handle.net/1807/126904)” | <https://hdl.handle.net/1807/126904>

M.A. Psychology **2016 – 2017**
University of Toronto (cGPA: 4.00/4.00) – Advisor: Morgan D. Barense
Committee Members: Morgan D. Barense, Keisuke Fukuda, Andy C. H. Lee

Hon. B. Sc. Psychology with High Distinction **2012 – 2016**
University of Toronto Scarborough (cGPA: 3.85/4.00) – Honours Thesis: Andy C. H. Lee

PUBLICATIONS

1. **Li, A. Y., & Mur, M.** (*Accepted*). Neural networks need real-world behavior. [Invited commentary on “Deep problems with neural network models of human vision,” by Bowers et al]. *Behavioral and Brain Sciences*. Preprint: <https://doi.org/10.31234/osf.io/tswpa>
2. **Li, A. Y.***, Yuan, J. Y.*, Pun, C., & Barense, M. (2023). The effect of memory load on object reconstruction: Insights from an online mouse-tracking task. *Attention, Perception, & Psychophysics*. <https://doi.org/10.3758/s13414-022-02650-9>. *Denotes equal contribution.

3. Li, A. Y., Fukuda, K., & Barense, M. D. (2022). Independent features form integrated objects: Using a novel shape-color “conjunction task” to reconstruct memory resolution for multiple object features simultaneously. *Cognition*, 223, 105024. <https://doi.org/10.1016/j.cognition.2022.105024>
4. Li, A. Y. (2021). Object and Spatial Context Representations in Visual Short-Term Memory. *eNeuro*, 8(2). DOI: [10.1523/ENEURO.0076-21.2021](https://doi.org/10.1523/ENEURO.0076-21.2021)
5. Sone, H., Kang, M.-S., Li, A. Y., Tsubomi, H., & Fukuda, K. (2021). Simultaneous estimation procedure reveals the object-based, but not space-based, dependence of visual working memory representations. *Cognition*, 209, 104579. <https://doi.org/10.1016/j.cognition.2020.104579>
6. Li, A. Y., Liang, J. C., Lee, A. C. H., & Barense, M. D. (2020). The Validated Circular Shape Space: Quantifying the visual similarity of shape. *Journal of Experimental Psychology: General*, 149(5), 949–966. <https://doi.org/10.1037/xge0000693>

NON-REFEREED PUBLICATIONS

1. Li, A. Y., Ladyka-Wojcik, N., Qazilbash, H., Golestani, A., Walther, D. B., Martin, C. B., Barense, M. D. (*Major Revisions at eLife*). Multimodal object representations rely on integrative coding. *Preprint*. <https://doi.org/10.1101/2022.08.31.504599>
2. Li, A. Y., Fukuda, K., Lee, A. C. H., & Barense, M. D. (*Revise & Resubmit*). Visual interference can help and hinder memory: Capturing representational detail using the Validated Circular Shape Space. *Preprint*: <https://doi.org/10.1101/535922>
3. Li, A. Y., & Barense, M. D. (*in prep*). *Invited review at WIREs Cognitive Science*.

TEXTBOOK CHAPTERS

1. Barense, M. D., Li, A. Y., Warren, J. D., Bussey, T. J., Saksida, L. M. (*Forthcoming*). Chapter 4. The temporal lobes. In Husain, M., & Schott, J. M. (Eds.), *Oxford Textbook of Cognitive Neurology and Dementia* (2nd ed.). DOI: 10.1093/med/9780199655946.001.0001

FELLOWSHIPS & GRANTS

- **\$110,000** – BrainsCAN Postdoctoral Fellowship Award, Computational Core (2023 – 2025)
- **\$13,700** – Doctoral Completion Award (2021, 2022)
- **\$70,000** – Alexander Graham Bell Canada Graduate Scholarships-Doctoral Award (2019 – 2021)
- **\$17,500** – Canada Graduate Scholarships-Master’s Program (CGS M) Award (2017 – 2018)
- **\$560** – SGS Conference Grant (2017, 2018)
- **\$250** – UTGSU Conference Bursary (2017)
- **Approx. \$3,800/yr.** – University of Toronto Fellowship (2016 – 2021)
- U of T Education Workers Entrance Scholarship CUPE 3902 (2012)

AWARDS & RECOGNITIONS

- **Honorable Mention (Runner-Up)** – 3-Minute Thesis Competition; *Department of Psychology, University of Toronto* (2022)
- **Best Talk (2nd of 16)** - Psychology Graduate Students Association Symposium. (2022). **Awarded to undergraduate student James Yuan*

- **Best Poster (1st of 72)** – Lake Ontario Visionary Establishment Conference (2020). *Awarded to undergraduate student Victoria Silva
- **Best Poster (2nd of 68)** – Lake Ontario Visionary Establishment Conference (2018)
- **Outstanding Talk Award (1st of 32)** – Toronto Area Memory Group (TAMeG) Conference (2018)
- **Finalist** – University of Toronto Scarborough, Undergraduate Research Forum (2016)
- University of Toronto Scarborough Deans List (2013 – 2016)
- **‘Budding Scholar’** – for exceptional academic performance in *Intro. to Psychology* (2013)

TALKS & INVITED PRESENTATIONS

1. **Li, A.Y.** (February 2023). Measuring object and context representations from continuous behavioral dynamics. *Aly & Baldassano Lab Meeting*, Columbia University. [Invited Presentation].
2. **Li, A. Y.**, Ladyka-Wojcik, N., Qazilbash, H., Golestani, A., Walther, D. B., Martin, C. B., & Barense, M. D. (November 2022). Forming 3-dimensional multimodal object representations relies on integrative coding. *Nanosymposium Talk, Society for Neuroscience*. San Diego, California.
3. **Li, A. Y.**, Yuan, J. Y., Pun, C., & Barense, M. D. (June 2022). Memory load increases feature binding errors during object reconstruction: An online mouse-tracking study using executables. *Working Memory Symposium*. Online Conference.
4. **Li, A. Y.**, Ladyka-Wojcik, N., Martin, C. B., Qazilbash, H., Golestani, A., Walther, D. B., & Barense, M. D. (2022). Forming 3-dimensional multimodal object representations relies on integrative coding. *Journal of Vision*, 22, 3286. <https://doi.org/10.1167/jov.22.14.3286>
5. **Best Talk (2nd of 16)** – Yuan, J. Y.*†, **Li, A. Y.***, Pun, C., & Barense, M. D. (January 2022). Online Psychological Testing using Executables: A Case Study on Visual Memory Resolution. *Psychology Graduate Students Association Symposium*. Online Conference. †Primary presenter. *co-first authorship
6. **Li, A. Y.**, Fidalgo, C. O., Liang, J., Lee, A. C. H., & Barense, M. D.† (October 2018). Dissimilar interference erases, similar interference blurs: The nature of mnemonic interference explored using a novel perceptually uniform shape space. *Memory Disorders Research Society*. Toronto, Canada. †Primary presenter
7. **Outstanding Talk Award (1st of 32)** – **Li, A. Y.**, Fidalgo, C. O., Liang, J., Lee, A. C. H., & Barense, M. D. (May 2018). Dissimilar interference erases, similar interference blurs: The nature of mnemonic interference explored using a novel perceptually uniform shape space. *Toronto Area Memory Group*. Toronto, Canada.
8. **Li, A. Y.**, Fidalgo, C. O., Lee, A. C. H., & Barense, M. D. (June 2017). The impact of mnemonic interference on memory for visual form. *Canadian Society for Brain, Behaviour, and Cognitive Sciences (CSBBCS)*. Regina, Canada. **Session Chair for Psycholinguistics**. URL: https://www.csbbcs.org/ocs/public/conferences/1/schedConfs/1/program-en_US.pdf

CONFERENCE POSTERS

1. Shimshek, E., **Li, A. Y.**, Wang, H., Rong, M., Stevenson, R. A., & Barense, M. D. (2023). Training multisensory perceptual binding improves visual object memory. *Lake Ontario Vision Establishment (LOVE)*.

2. Yuan, J., **Li, A. Y.**, Pun, C., & Barense, M. D. (2023). The effect of memory load on object reconstruction: Insights from an online mouse-tracking task. *Lake Ontario Visionary Establishment (LOVE)*.
3. **Li, A. Y.**, Ladyka-Wojcik, N., Martin, C. B., Qazilbash, H., Golestani, A., Walther, D. B., & Barense, M. D. (2022). Forming 3-dimensional multimodal object representations relies on integrative coding. *Psychology Graduate Students Association Symposium*. Online Conference.
4. Yuan, J., **Li, A. Y.**, & Barense, M. D. (2021). Online psychological testing using executables: A case study using a continuous shape-color retrieval task. *Canadian Society for Brain, Behaviour and Cognitive Science: Annual Meeting 2021*. Online Format.
5. **Li, A. Y.**, Qazilbash, H., & Barense, M. D. (2021). Forming real-world multisensory concepts. *Canadian Society for Brain, Behaviour and Cognitive Science: Annual Meeting 2021*. Online Format.
6. **Li, A. Y.***, Ladyka-Wojcik, N.*, Silva, V. M., & Barense, M. D. (2020). Asymmetry between object-in-place and place-in-object memory: Evidence for a spatial scaffold. *Context and Episodic Memory Symposium*. Online Format.
7. **Li, A. Y.***, Huang, A., & Barense, M. D. (2020). Coarse-grained event segmentation induces false memory. *Cognitive Neuroscience Society*. Online Format. Video: https://www.youtube.com/watch?v=8C_UDzz61ik&feature=youtu.be
8. **Best Poster (1st of 72)** – Silva, V., **Li, A. Y.***, Ladyka-Wojcik, N.*, & Barense, M. D. (2020). Moving beyond yes and no: Using VR to understand age-related changes in multidimensional experience. *Lake Ontario Visionary Establishment (LOVE)*. URL: https://drive.google.com/file/d/1ACjnj_3iG947tLJbfL3U1nGOJ-CvEu4K/view
9. Qazilbash, H., **Li, A. Y.**, & Barense, M. D. (2020). Learning how we learn: Exploring 2D vs. 3D multisensory object representations. *Lake Ontario Visionary Establishment (LOVE)*. URL: https://drive.google.com/file/d/1ACjnj_3iG947tLJbfL3U1nGOJ-CvEu4K/view
10. Rong, M.*, Wang, H.*, **Li, A. Y.**, Stevenson, R., & Barense, M. D. (2020). Training multisensory perceptual binding improves high-fidelity object memory. *Lake Ontario Visionary Establishment (LOVE)*. URL: https://drive.google.com/file/d/1ACjnj_3iG947tLJbfL3U1nGOJ-CvEu4K/view
11. **Li, A. Y.** (November 2019). Quantifying Representation. *The Friends of Patrick Brain Research Scholarship & Acceleration Fund*, University of Toronto. [Invited Poster Presentation]/
12. **Li, A. Y.**, Fukuda, K., & Barense, M. D. (2019). High-fidelity visual features form complex objects in memory. *Journal of Vision*, 19, 76b. doi:10.1167/19.10.76b
13. Sone, H., **Li, A. Y.**, & Fukuda, K. (2019). Simultaneous recall procedure reveals integrated object representations in VWM. *Journal of Vision*, 19, 202. doi:10.1167/19.10.202
14. **Li, A. Y.**, Fukuda, K., & Barense, M. D. (2019). High-fidelity visual features form complex objects. *Lake Ontario Visionary Establishment (LOVE)*. URL: <https://drive.google.com/file/d/1e3YQ5hrD528m0-pSMiEjvn2SDBZTna2O/view>
15. Sone, H., **Li, A. Y.**, & Keisuke, F. (2019). Object-based nature of visual working memory precision. *Lake Ontario Visionary Establishment (LOVE)*. URL: <https://drive.google.com/file/d/1e3YQ5hrD528m0-pSMiEjvn2SDBZTna2O/view>
16. Wang, H., **Li, A. Y.**, Stevenson, R. A., & Barense, M. D. (2019). Memory fidelity for objects

and temporal binding windows. *Lake Ontario Visionary Establishment (LOVE)*. URL: <https://drive.google.com/file/d/1e3YQ5hrD528m0-pSMiEjvn2SDbZTna2O/view>

17. Li, A. Y., Fidalgo, C. O., Liang, J., Lee, A. C. H., & Barense, M. D. (Sept 2018). Examining the impact of item-distractor similarity using a validated circular shape space. *Journal of Vision*, 18(10), 817. doi:10.1167/18.10.817
18. Rusnyak, R., Li, A. Y., Tennant, J. M., & Barense, M. D. (Feb 2018). Creation and validation of a perceptually circular sound space. *Lake Ontario Visionary Establishment (LOVE)*. URL: https://drive.google.com/file/d/1213EWu4B7kU2w_830LlpQ82_92duJ4L/view
19. **Best Poster (2nd of 68)** – Li, A. Y., Rong, M., Stevenson, R. A., & Barense, M. D. (Feb 2018). Separate multisensory perceptual binding measures are differentially associated with spatial and temporal visual working memory. *Lake Ontario Visionary Establishment (LOVE)*. URL: https://drive.google.com/file/d/1213EWu4B7kU2w_830LlpQ82_92duJ4L/view
20. Sone, H., Li, A. Y., & Keisuke, F. (Dec 2017). Object-based nature of visual working memory precision. *University of Toronto Undergraduate Forum*.
21. Li, A. Y., Fidalgo, C. O., Lee, A. C. H., & Barense, M. D. (Sept 2017). The impact of mnemonic interference on memory for visual form. *Journal of Vision*, 17(10), 96. doi:10.1167/17.10.96
22. Li, A. Y., Fidalgo, C. O., Lee, A. C. H., & Barense, M. D. (Feb 2017). The impact of mnemonic interference on memory for visual form. *Lake Ontario Visionary Establishment (LOVE)*. URL: http://qvcl.queensu.ca/love/programs/2017_46_LOVE_Program.pdf
23. Fidalgo, C., Li, Y., Barense, M. D., & Lee, A. C. H. (Feb 2016). How Interference Affects Accuracy and Precision for Object Colour and Shape. *Lake Ontario Visionary Establishment (LOVE)*. URL: http://qvcl.queensu.ca/love/LOVE_Poster_sessions_2016.pdf
24. Li, Y., Crump, L., Sharma, M., Sacco, R., Smith, E., & Saposnik, G. (Feb 2016). Influence of Aversion to Uncertainty in STROKE Care. *Stroke*, 47, TP336. URL: http://stroke.ahajournals.org/content/47/Suppl_1/ATP336.abstract?sid=8d1c12d8-849a-401d-bc17-0239617039d2
25. Crump, L., Li, Y., Sharma, M., Sacco, R., Smith, E., & Saposnik, G. (Feb 2016). Physicians' Preferences in the Management of Silent Stroke: Results from a Worldwide Survey. *Stroke*, 47, TMP37. URL: http://stroke.ahajournals.org/content/47/Suppl_1/ATMP37.abstract?sid=a8c83401-343c-4420-ad96-0f87f76dfc4c

TEACHING & WORK EXPERIENCE

Course Instructor

2020 – 2021

University of Toronto

- PSY372: Human Memory. *In-person* (Sept. 2021 – Dec. 2021)
- PSYB57: Introduction to Cognitive Psychology. *Online Asynchronous* (May 2021 – Aug. 2021)
- PSYB57: Introduction to Cognitive Psychology. *Online Asynchronous* (Jan. 2021 – Apr. 2021)
- PSYD50: Current Topics in Memory & Cognition. *Online Synchronous Seminar* (Sept. 2020 – Dec. 2020)

Teaching Assistant

2016 – 2022

University of Toronto

- PSY450: History of Psychology (Jan. 2021 – May 2021)
- PSY201: Statistics I (May 2019 – July 2019; Sept. 2020 – Dec. 2020)
- PSY493: Cognitive Neuroscience (July 2020 – Aug. 2020; Sept. 2022 – Dec. 2022); *Guest Lectures – Memory*
- PSY202: Statistics II (Jan. 2020 – Apr. 2020)
- PSY379: Memory Lab (Sept. 2019 – Dec. 2019)
- PSY370: Thinking & Reasoning (Sept. 2018 – Dec. 2018)
- PSY372: Human Memory (July 2018 – Aug. 2018)
- PSY280: Sensation & Perception (Jan. 2018 – April 2018; Jan. 2019 – Apr. 2019)
- PSY270: Intro. to Cognitive Psychology (Jan. 2017 – Dec. 2017); *Guest Lectures – Visual Imagery, Introduction to Memory*
- PSY100: Introduction to Psychology (Sept. 2016 – Dec. 2016)

Data Analyst

2016

- Postgraduate Medical Education, *University of Toronto*

MENTORSHIP

- Christina Saliba, *Research Opportunity Program* (2022 – Present)
- Astrid Amador, *Research Opportunity Program* (2022 – Present)
- Eliz Shimshek, *Research Opportunity Program* (2021 – Present)
- James Yuan, *Research Opportunity Program*; *NSERC Undergraduate Student Research Award* (2020 – Present)
- Victoria Silva, *Lab Manager*; *NSERC Undergraduate Student Research Award* (2019 – 2022). Medical student, University of Calgary.
- Ishan Ghosh, *Research Assistant* (2020 – 2022). Graduate student, Department of Neurobiology at University of Chicago.
- Heba Qazilbash, *Independent Project Student*; *Research Exchange Award* (2018 – 2021). Graduate student, Dalla Lana School of Public Health at University of Toronto.
- Audrey Huang, *Research Opportunity Program* (2019 – 2020). Law student, Peter A. Allard School of Law at University of British Columbia.
- Helena Wang, *Independent Project Student*; (2018 – 2020). Graduate student, Brain and Mind Institute at Western University.
- Marlene Rong, *Lab Manager*; *Independent Project Student* (2017 – 2020). Graduate student, Institute of Medical Science at University of Toronto. Medical student, University of Alberta.

PROFESSIONAL SERVICE

1. Ebbinghaus Empire Speaker Series Co-organizer, *University of Toronto Department of Psychology* (2019 – 2020)
2. University of Toronto St. George Graduate Student Representative, *Psychology Graduate Chair Search Committee* (2018)

3. Session Chair, *Canadian Society for Brain, Behaviour, and Cognitive Sciences* (2017)
4. Inkblot: The Undergraduate Journal of Psychology, *Graduate Advisor* (2016 – 2019)
5. Psychology Graduate Students Association, *Graduate-Led Academic Speaker Series (GLASS) Coordinator* (2017 – 2018); *Social Coordinator* (2016 – 2018); *PGSA Buddy Program* (2017 – 2022); *Peer Mentorship Program* (2019 – 2022); *Keynote and Workshop Symposium Planning Committee* (2021 – 2022)

Reviewed for: Attention, Perception, & Psychophysics; Behavioral Research Methods; Cognitive, Affective, and Behavioral Neuroscience; Cerebral Cortex; Cortex; eLife; eNeuro; Journal of Experimental Psychology: General; Journal of Cognitive Neuroscience; Nature Neuroscience; Neuron; Neuropsychologia; PLOS ONE; Psychological Science; WIREs Cognitive Science

SCIENTIFIC OUTREACH

1. Summer Psychology Research Initiative (SPRINT) – mentor for underrepresented high school students interested in cognitive psychology and neuroscience. *Department of Psychology, University of Toronto.* (2022).
2. Guest speaker for 40+ high school and university students interested in the research process. Taught online module on meta-analysis; provided peer review for student papers. *Nexus Laboratories Inc., Toronto, Canada.* (2020)

MEMBERSHIP

1. Canadian Society for Brain, Behaviour, and Cognitive Sciences
2. Cognitive Neuroscience Society
3. Society for Neuroscience
4. Vision Sciences Society