Harrison Ritz

harrisonritz.github.io
hritz@princeton.edu

Academic Appointments

2022 - Current	**C.V. Starr Postdoctoral Fellow** Princeton Neuroscience Institute (Princeton University, USA) Lab PIs: Jonathan Cohen & Nathaniel Daw

Education

2016 – 2022	**Doctor of Philosophy** in Psychology Brown University (USA) Lab PIs: Amitai Shenhav & Michael J. Frank Thesis: *Multivariate Cognitive Control*
2014 – 2016	**Master of Science** in Psychology (Cognitive and Behavioral Neuroscience) University of Western Ontario (Canada) Lab PI: Ingrid Johnsrude Thesis: *The effects of concurrent cognitive load on the processing of clear and degraded speech*
2010 – 2014	**Bachelor of Science** in Psychology (Honors, Distinction) Queen's University (Canada) Honors Thesis Supervisor: Ingrid Johnsrude Thesis: *Attention enhances phase-locking in the brainstem frequency-following response*

Accolades & Funding

2022	*C.V. Starr Foundation Postdoctoral Fellowship*, Princeton University
2019 – 2020	*Carney Graduate Award in Brain Science*, Brown University ($55,000 USD)
2019	*Cognitive Science Society Travel Award* ($500 USD)
2018 – 2019	*Eimas Graduate Research Award*, Brown University ($1,000 USD)
2014	*Certificate of Academic Excellence* for top honors thesis in graduating class, Canadian Psychological Association
2011	*Summer Work Experience Program*, Queen's University ($2,500 CAD)
2010 – 2014	*Dean's Honor List*, Queen's University
2010 – 2014	*Foresters Competitive Scholarship* ($8,000 CAD)
2010	*Queen's University Excellence Scholarship* ($2,000 CAD)

Peer-Reviewed Publications

Ritz, H., Wild, C.J., & Johnsrude, I.J. (2022). Parametric Cognitive Load Reveals Hidden Costs in the Neural Processing of Perfectly Intelligible Degraded Speech. *Journal of Neuroscience 42(23)*, 4619–4628.

Rmus, M., **Ritz, H.**, Hunter, L.E., Bornstein, A.M., & Shenhav, A. (2022). Humans can navigate complex graph structures acquired during latent learning. *Cognition*, *225*, 105103.

Ritz, H., Leng, X., & Shenhav, A. (2022). Cognitive Control as a Multivariate Optimization Problem. *Journal of Cognitive Neuroscience*, 1–23.

Leng, X., Yee, D., **Ritz, H.**, & Shenhav, A. (2021). Dissociable influences of reward and punishment on adaptive cognitive control. *PLoS Computational Biology*, *17*(12), e1009737.

Ritz, H., Frömer, R., & Shenhav, A. (2020). Bridging motor and cognitive control: It's about time! (Spotlight). *Trends in Cognitive Sciences*. *24*(1), 6–8.

Nassar, M.R., McGuire, J.T., **Ritz, H.**, & Kable, J. (2019). Dissociable forms of uncertainty-driven representational change across the human brain. *Journal of Neuroscience*, 39(9), 1688-1698.

Ritz, H., Nassar, M.R., Frank, M.J., & Shenhav, A. (2018). A control theoretic model of adaptive behavior in dynamic environments. *Journal of Cognitive Neuroscience, 30(10),* 1405-1421.

Manuscripts Under Review or In Revision

Ritz, H.*, Frömer, R.*, & Shenhav, A. Phantom controllers: Misspecified models create the false appearance of adaptive control during value-based choice. Preprint: https://doi.org/10.1101/2023.01.18.524640

Rier, L., Michelmann, S., **Ritz, H.**, Shah, V., Hill, R.M., Osborne, J., Doyle, C., Holmes, N., Bowtell, R., Brookes, M.J., Norman, K.A., Hasson, U., Cohen, J.D., Boto, E. Test-Retest Reliability of the Human Connectome: An OPM-MEG study. Preprint: https://doi.org/10.1101/2022.12.21.521184

Ritz, H., & Shenhav, A. Orthogonal neural encoding of targets and distractors supports multivariate cognitive control. Preprint: https://doi.org/10.1101/2022.12.01.518771

Ritz, H., & Shenhav, A. Humans reconfigure target and distractor processing to address distinct task demands. Preprint: https://doi.org/10.1101/2021.09.08.459546

Peer-Reviewed Conference Proceedings

Ritz, H., Jha, A., Pillow, J., & Cohen J.D. (upcoming 2023). Task preparation is reflected in neural state space dynamics. *Cognitive Computational Neuroscience* (2023). San Francisco, USA. [accepted, TBD].

Ritz, H., Wolf, W., & Cohen J.D. (upcoming 2023). Continuous and Discrete Transitions during Task-Switching. *Cognitive Science Society*. San Francisco, USA. [accepted, Poster].

Ritz, H. & Shenhav, A. (2022). Orthogonal neural encoding of targets and distractors supports cognitive control. *Cognitive Computational Neuroscience*. San Francisco, USA. [Poster].

Ritz, H., DeGutis, J., Frank M.J., Esterman, M., & Shenhav, A. (2020). An evidence accumulation model of motivational and developmental influences over sustained attention. *Cognitive Science Society.* Toronto, CA. [Poster].

Leng, X., **Ritz, H.**, Yee, D., & Shenhav, A. (2020). Dissociable influences of reward and punishment on adaptive cognitive control. *Cognitive Science Society.* Toronto, CA. [Poster]

Ritz, H. & Shenhav, A. (2019). Parametric control of distractor-oriented attention. *Cognitive Science Society.* Montreal, CA. [**Paper Talk**].

Ritz, H., Nassar, M.R., Frank, M.J., & Shenhav, A. (2019). Decisions about reward and effort for the learning and control of dynamical systems. *Reinforcement Learning and Decision Making.* Montreal, CA. [Poster].

Ritz, H., Nassar, M.R., Frank, M.J., & Shenhav, A. (2017). Behavioral evidence for PID-like feedback control. *Reinforcement Learning and Decision Making.* Ann Arbor, USA. [Poster and **Poster Spotlight Talk**].

Chaired Conference Symposia and Workshops

Nov. 2022 *Cortical Basis of Cognitive Control Across Species (*Nanosymposium Chair). Society for Neuroscience. San Diego, USA.

External Department Talks

Oct. 2022 Rotman Research Institute in Baycrest Hospital. Toronto, CA.
Feb. 2020 *ConCat Series*, New York University. New York, USA.
May 2018 *CBC Series*, Universitat Pompeu Fabra. Barcelona, ES.

External Laboratory Talks

Apr. 2023 *Egner Lab*, Duke University.
Sept. 2022 *Summerfield Lab*, University of Oxford.
June 2022 *BLRB Group*, University of Chicago. Chicago, USA.
Feb 2022 *Woolgar Lab*, University of Cambridge.
Feb 2022 *Egner Lab*, Duke University.
Nov 2021 *Otto Lab*, McGill University.
Oct. 2021 *Ghent Effort Group*, Ghent University. Ghent, BE.
July 2021 *Mars Lab*, University of Oxford.
June 2021 *CoCoA Lab (Taraz Lee)*, University of Michigan.
May 2021 *Verguts Lab*, Ghent University.
Apr. 2021 *Western Sensorimotor SuperLab*, Western University.
Feb. 2021 *Summerfield Lab*, University of Oxford.
Nov. 2020 *Jazayeri Lab*, Massachusetts Institute of Technology.
Oct. 2020 *Schultz Lab*, Max Planck Institute for Biological Cybernetics.
Sept. 2020 *Kool Lab*, University of Washington in St. Louis.
Aug. 2020 *Collins Lab*, University of California Berkeley.
May 2020 *McGuire Lab*, Boston University.
Apr. 2020 *Hayden Lab*, University of Minnesota.
Mar. 2020 *Donner Lab*, Hamburg University.

Conference Posters and Talks

Ritz, H. & Shenhav, A. Orthogonal neural encoding of targets and distractors supports cognitive control.

- *Workshop on Mental Effort* (2022). Providence, USA. [Poster].

Ritz, H., Frömer, R. & Shenhav, A. Disentangling stimulus-driven and controlled processes during value-based decision making.

- *Society for Neuroscience* (2021). Online. [Poster].
- *Society for Neuroeconomics* (2021). Online. [Poster].

Ritz, H., Hayden, B., Shenhav, A., Yoo, S.B., Optimal control of approach-avoidance dynamics.

- *Neuromatch 3.0* (2020). Online. [**Talk**].

Ritz, H., Nassar, M.R., Frank, M.J., & Shenhav, A., Optimal decision-making in metric space.

- *Society for Neuroeconomics* (2020). Online. [Poster and **Poster Spotlight Talk**].

Ritz, H., & Shenhav, A. Humans reconfigure target and distractor processing to address distinct task demands
- *Workshop on Mental Effort* (2021). Online. [Poster].
- *Motivational and Cognitive Control* (2019). Berlin, DE. [Poster].
- *Control Processes* (2019). Providence, USA. [Poster].
- *Cognitive Neuroscience Society* (2018). Boston, USA. [Poster].

Rmus, M., **Ritz, H.**, Hunter, L., Bornstein, A., & Shenhav. A. Humans can navigate complex graph structures acquired during latent learning.
- *Reinforcement Learning and Decision Making* (2019). Montreal, CA. [**Workshop Talk**].
- *Society for Neuroeconomics* (2018). Philadelphia, USA. [**Talk by M.R.**].

Ritz, H., DeGutis, J., Frank M.J., Esterman, M., & Shenhav, A. Modeling motivational influences on sustained attention.
- *Winter Conference on Brain Research* (2019). Snowmass, USA. [Poster].
- *Society for Neuroeconomics* (2018). Philadelphia, USA. [Poster].

Ritz, H., Dean Wolf, C., Frömer, R., & Shenhav, A. Quantifying the demands of value-based decision-making with short-term memory interference.
- *Cognitive Neuroscience Society* (2019). San Francisco, USA. [Poster].

Ritz, H., Nassar, M.R., Frank, M.J., & Shenhav, A. Behavioral evidence for PID-like feedback control.
- *Society for Neuroscience* (2017). Washington, USA. [**Nanosymposium Talk**].
- *New England Research in Decision-Making* (2017). Providence, USA. [**Talk**].
- *Brown Mind Brain Research Day* (2017). Providence, USA. [Poster].

Ritz, H., Wild, C., & Johnsrude, I.J. The effects of concurrent cognitive load on the processing of clear and degraded speech.
- *Organization for Human Brain Mapping* (2016). Geneva, CH. [Poster].

Ritz, H., Arbuckle, S., Wild, C., & Johnsrude, I.J. Enhanced recognition memory for acoustically degraded sentences.
- *Association for Research in Otolaryngology* (2015). San Diego, USA. [**Podium Talk by I.J.**].
- *Brain and Mind Institute Symposium* (2015). London, CA. [Poster].

Ritz, H. & Johnsrude, I.J. Attention enhances phase-locking in the frequency following response.
- *Canadian Society of Brain, Behaviour, and Cognitive Science.* (2014). Toronto, CA. [Poster].
- *McMaster University NeuroXchange Conference* (2014). Hamilton, CA. [Poster].

Competitive Research Courses

Summer 2019	*Kavli Summer Institute in Cognitive Neuroscience*, Santa Barbara, USA.
Summer 2017	*Methods in Neuroscience at Dartmouth*, Hanover, USA.

Service Roles

2023	*PNI Summer Internship Program Mentor*, Leadership Alliance & Princeton University
2022 - 2024	*PNI Climate and Inclusion Committee*, Princeton University
2021	*FYRE Teaching Assistant*, Leadership Alliance & Brown University

2020 – 2021	*Departmental Colloquium Committee*, Brown University
2018 – 2019	*Cognition Seminar Series Organiser*, Brown University
2017 – 2018	*Psychology Graduate Student Representative*, Brown University
2017 – 2022	*Optimism Walk Participant*, American Parkinson Disease Association
2017 – 2020	*Brown Brain Week Participant*, Brown University
2015 – 2016	*Psychology Graduate Student Representative*, Western University
2015 – 2016	*Psychology Colloquium Committee*, Western University
2013 – 2014	*Psychology Undergraduate Student Council*, Queen's University

Teaching

Spring 2019	*fMRI: Theory and Practice*, Brown University, TA
Spring 2018	*Cognitive Neuropsychology*, Brown University, TA
Fall 2017	*Social Psychology*, Brown University, TA
2015 – 2016	*Statistics using Computers (full year)*, Western University, TA
2014 – 2015	*Sensation and Perception (full year)*, Western University, TA
2012 – 2013	*Introduction to Psychology (full year)*, Queen's University, TA

Mentorship

2019 – 2022	Christopher Bravo (RA)
2021	Kyle Chen (RA)
2019 – 2020	Jennifer Dzul (honors thesis: *Are Distractors really that Distracting? A Closer Look into Target vs Distractor Sensitivity in Older Adults*)
2019 – 2020	Natalie Knowles (RA)
2019	Savannah Doelfel (RA)
2017 – 2019	Allison Loynd (RA)
2017 – 2018	Milena Rmus (honors thesis: *Model-based decision-making is associated with structure inference ability*)
2017	William McNelis (RA)
2016 – 2017	Kia Sadahiro (RA)
2015 – 2016	Jessica Uthayakumar (honors thesis: *Consequences of acoustic degradation and semantic context on recognition memory*)

Pre-Graduate Research Experience

2013 – 2014	*Research Assistant*, Queen's University. PI: Dr. Ingrid Johnsrude
2011 – 2012	*Research Assistant*, Queen's University. PI: Dr. Monica Castelhano
Summer 2010	*Research Assistant*, Juravinski Cancer Centre. PI: Dr. Jehonathan Pinthus

Ad Hoc Reviewer

eLife; Journal of Neuroscience; Neuroimage; Cognitive, Affective, & Behavioral Neuroscience; Computational Brain & Behavior; Journal of Experimental Psychology