

Noam Miller

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DEGREES

- 2010 Ph.D., Psychology, University of Toronto, Toronto, ON, Canada.
- 2005 M.A., Psychology, University of Toronto, Toronto, ON, Canada.
- 2003 B.Mus., Performance, Thompson Rivers University, BC, Canada.
- 2002 Performance Diploma (Clarinet). The Glenn Gould School at the Royal Conservatory of Music, Toronto, ON, Canada.
- 1997 B.Sc., Biology, Tel-Aviv University, Tel-Aviv, Israel.

EMPLOYMENT HISTORY

- 2019-present Associate professor, Departments of Psychology & Biology, Wilfrid Laurier University, Waterloo, ON, Canada.
- 2014-2019 Assistant professor, Department of Psychology, Wilfrid Laurier University, Waterloo, ON, Canada [cross-appointed in the Biology Department since September 2017].
- 2012-2014 Post-doctoral researcher (NSF), Ecology & Evolutionary Biology Department, Princeton University, Princeton, NJ, USA (supervisor: Iain Couzin).
- 2010-2012 NSERC Post-doctoral fellow, Ecology & Evolutionary Biology Department, Princeton University, Princeton, NJ, USA (supervisor: Iain Couzin).
- 2002-2004 Library manager, Royal Conservatory of Music, Toronto, ON, Canada.
- 2000-2004 Research assistant for Sara Shettleworth (part-time), Department of Psychology, University of Toronto, Toronto, ON, Canada.
- 1996-1998 Research assistant for Ilan Golani (part-time), Department of Zoology, Tel-Aviv University, Tel-Aviv, Israel.

TEACHING EXPERIENCEWilfrid Laurier University, Waterloo, ON. Department of Psychology.

2015 – present: Course instructor for PS261, “Introduction to Learning” (Every Fall & Winter term since Winter 2015), PS263, “Biopsychology” (Winter 2015, Fall 2015, Fall 2016, Winter 2017), PS461, “Seminar in Learning” (Winter 2016), and PS861, “Seminar in Comparative Cognition” (Fall 2017). Full responsibility for designing the course, creating course content, delivering the lectures, etc.

Princeton University, Princeton, NJ. Department of Ecology & Evolutionary Biology.

2011 – 2014: Supervised three undergraduate thesis students. Assisted them in designing experiments and analyzing their data. Studies involved the effects of behavioral syndromes on collective motion in zebrafish and the combined effects of hunger and information levels on collective decisions in Golden shiners.

2011, 2012: Guest lectured on “Collective Learning” and “Collective Decision-Making” in EEB323 “Integrative Dynamics of Animal Behavior”.

University of Toronto Mississauga, Mississauga, ON, Canada. Department of Psychology.

2009 – 2010: Supervised two undergraduate research thesis students. Both projects involved studying the effects of alcohol and nicotine on collective behavior in zebrafish. This work has been published (Miller et al., 2013, BBR).

2006, 2007, 2009: Course instructor for PSY 362, “Animal Cognition”. Full responsibility for designing the course, creating course content, delivering the lectures, etc.

2004 – 2010: Teaching Assistant. PSY 100 (Introduction to Psychology), 252 (Introduction to Animal Behavior), 255 (Animal Behavior), 260 (Learning & Cognition), 355 (Animal Behavior Genetics), 362 (Animal Cognition), 369 (Conditioning & Learning Laboratory), 393 (Human Neuropsychology), 397 (Neuroplasticity).

PUBLICATIONS

(Names of graduate students are bolded; names of undergraduate students are underlined).

Skinner M, Miller N (2020). Aggregation and social interaction in garter snakes (*Thamnophis sirtalis sirtalis*). *Behavioral Ecology & Sociobiology*, 74:51.

Damphousse C, Marrone D, Miller N (2019). Pair foraging degrades socially transmitted food preferences in rats. *Animal Cognition*, 22:1027-1037.

Miller N (in press). Social behavior and genetics in zebrafish. In R Gerlai (Ed), *Behavioral and Neural Genetics of Zebrafish*. Elsevier.

Ayoub R, Armstrong E, Miller N (2019). Out of sight, out of mind: mechanisms of social choice in fish. *Animal Behaviour*, 155:163-169.

Miller N (2018). Raising the bar on studying cultural evolution. *Learning & Behavior*, 46:5-6 [outlook paper; commentary].

Miller N (2018). Social learning and associative processes: a synthesis. *Journal of Experimental Psychology: Animal Learning and Cognition*, 44:105-113.

Delcourt J, Miller NY, Couzin ID, Garnier S (2018). Methods for the effective study of collective behavior in a radial arm maze. *Behavior Research Methods*, 50:1673-1685.

White DJ, Watts E, Pitchforth K, Agyapong S, Miller N (2017). ‘Sociability’ affects the intensity of mate-choice copying in female guppies, *Poecilia reticulata*. *Behavioural Processes*, 141:251-257.

Guayasamin OL, Couzin ID, Miller N (2017). Behavioural plasticity across social contexts is regulated by the directionality of inter-individual differences. *Behavioural Processes*, 141:196-204.

Miller N (2017). Cognition in fishes. *Behavioral Processes*, 141:137-140 [introduction to a special issue on fish cognition].

Kao A, Miller N, Torney C, **Hartnett A**, Couzin ID (2014). Collective learning and optimal consensus decisions in social animal groups. *PLoS Computational Biology*, 10(8): doi:10.1371/journal.pcbi.1003762

Miller N, Shettleworth SJ (2013). An associative model of instrumental choice: a response to Dupuis and Dawson. *Journal of Experimental Psychology: Animal Behavior Processes*, 39, 287-293.

Pérez-Escudero A, Miller N, **Hartnett AT**, Garnier S, Couzin ID, de Polavieja GG (2013). Estimation models describe well collective decisions among three options. *PNAS*, 110:E3466-3467 [letter; commentary].

Miller N, Garnier S, **Hartnett A**, Couzin ID (2013). Both information and social cohesion determine collective decisions in animal groups. *PNAS*, 110, 5263-5268.

- Kalueff AV, Gebhardt M, Stewart AM, Cachat JM, Brimmer M, Chawla JS, Craddock C, Kyzar EJ, Roth A, Landsman A, Gaikwad S, Robinson K, Baatrup E, Tierney K, Shamchuk A, Norton W, Miller N, Nicolson T, Braubach O, Gilman CP, Pittman J, Rosemberg DB, Gerlai R, Echevarria D, Lamb E, Neuhauss SCF, Weng W, Bally-Cuif L, Schneider H, ZIRC (2013). Towards a comprehensive catalog of zebrafish behavior 1.0, and beyond. *Zebrafish*, 10, 70-86.
- Miller N*, Greene K*, Dydinski A, Gerlai R (2013). Effects of nicotine and alcohol on zebrafish (*Danio rerio*) schooling. *Behavioural Brain Research*, 240, 192-196.
- Miller N, Gerlai R (2012). Automated tracking of zebrafish shoals and the analysis of shoaling behavior. In AV Kalueff & AM Stewart (Eds.), *Zebrafish Protocols for Neurobehavioral Research*. New York: Humana Press.
- Miller N, Gerlai R (2012). From schooling to shoaling: patterns of collective motion in zebrafish (*Danio rerio*). *PLoS ONE*, 7(11): doi:10.1371/journal.pone.0048865
- Miller NY, Gerlai R (2011). Redefining membership in animal groups. *Behavior Research Methods*, 43, 964-970.
- Miller NY, Gerlai R (2011). Shoaling in zebrafish: what we don't know. *Reviews in the Neurosciences*, 22, 17-25.
- Miller NY (2009). Modeling the effects of enclosure size on geometry learning. *Behavioral Processes*, 80, 306-313.
- Miller NY, Gerlai R (2008). Oscillations in shoal cohesion in zebrafish (*Danio rerio*). *Behavioural Brain Research*, 193, 148-151.
- Miller NY, Shettleworth SJ (2008). An associative model of geometry learning: a modified choice rule. *Journal of Experimental Psychology: Animal Behavior Processes*, 34, 419-422.
- Miller NY, Gerlai R (2007). Quantification of shoaling behavior in zebrafish (*Danio rerio*). *Behavioural Brain Research*, 184, 157-166.
- Miller NY, Shettleworth SJ (2007). Learning about Environmental Geometry: An Associative Model. *Journal of Experimental Psychology: Animal Behavior Processes*, 33, 191-212.
- Skov-Rackette SI**, Miller NY, Shettleworth SJ (2006). What-where-when memory in pigeons. *Journal of Experimental Psychology: Animal Behavior Processes*, 32, 345-358.

SELECTED GRANTS and AWARDS

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| 2020 | Wilfrid Laurier University Early Career Research Award. |
| 2019 | Wilfrid Laurier University Faculty of Science Teaching Award, Early Career. |
| 2016 – 2017 | Banting Research Foundation Discovery Award “Exploring neural mechanisms of social behavior using zebrafish (<i>Danio rerio</i>)” (Principal Investigator). |
| 2016 – 2020 | NSERC Discovery Grant “Collective learning and decision-making in animal groups” (Principal Investigator). |
| 2012 – 2014 | NSF collaborative research grant, “The Perceptual Basis of Collective Behavior in a Model Vertebrate” (grant co-author). |
| 2010 – 2012 | NSERC Post-Doctoral Fellowship, “The Dynamics of Schooling”. |
| 2008, 2009 | Ontario Graduate Scholarship. |

SELECTED RECENT PRESENTATIONS

- “Collective animal cognition”. Neuroscience and Applied Cognitive Science Program Seminar Series. University of Guelph, Guelph, ON. January 2020.

- “Collective cognition”. Psychology, Neuroscience, & Behavior (PNB) Colloquium Series. McMaster University, Hamilton, ON. February 2018.
- “Collective animal cognition: a framework”. Marschak Colloquium. UCLA, Los Angeles, CA. October 2017.
- “Out of sight, out of mind: flexible use of social information and learning in zebrafish”. Talk given at the Animal Behavior Society meeting. Scarborough, ONT, Canada; June 2017.
- “Social information use in fish”. Public lecture delivered as part of the Royal Canadian Institute for Science RCI Science Talks series, Toronto, ONT. February 12, 2017 [YouTube: <https://www.youtube.com/watch?v=KsWNhnFplXo#t=44m40s>].
- “Collective Cognition”. Invited talk given at the Graduate Colloquium series at Brooklyn College (CUNY), New-York, NY, USA; February 2016.
- “Collective Cognition”. Invited talk given at the Leibniz Institute for Freshwater Ecology (IGB), Berlin, Germany; September 2014.
- “Collective learning and the emergence of producer-scrounger dynamics”. Talk given at Collective Intelligence, MIT, Cambridge, MA, USA; June 2014.
- “Collective foraging and the evolution of visual search”. Talk given at Collective Dynamics of Communities and Populations, Princeton University, Princeton, USA; April 2014.
- “Collective Animal Cognition”. Invited talk at the University of Toronto, Ecology and Evolutionary Biology Seminar Series, Toronto, Canada; February 2014.

PROFESSIONAL MEMBERSHIPS

Animal Behavior Society
 Comparative Cognition Society
 Society for Neuroscience

AS A REVIEWER

Associate editor at *Animal Cognition* (since March 2020). Member of the editorial board of the *Journal of Experimental Psychology: Animal Learning and Cognition* (2017- 2019). Member of the review editorial board for *Frontiers in Comparative Psychology* since February 2015. Guest editor for a special issue of *Behavioural Processes* on cognition in fish (published 2017).

Behavioral Processes (2008-2009, 2012, 2014-2015, 2017)	Animal Behavior and Cognition (2018)
Journal of Experimental Psychology: Animal Learning & Cognition (2007-2009, 2012-2013, 2015-2019)	Behavior (2012)
Behavioral Brain Research (2009, 2011-2013, 2015)	Behavioral Ecology (2016)
PLoS One (2012-2014, 2016)	Current Biology (2016)
Zebrafish (2013, 2014, 2017)	Current Zoology (2013)
Animal Cognition (2013-2020)	eLife (2017)
Frontiers in Psychology (2015-2016, 2019- 2020)	Journal of Comparative Psychology (2017)
Scientific Reports (2015-2017)	Journal of Experimental Biology (2017)
Behavior Research Methods (2010, 2013)	Journal of Fish Biology (2012)
Cognition (2016, 2018)	Learning & Behavior (2014)
American Naturalist (2015)	Learning & Motivation (2014)
	Physiology & Behavior (2012)
	Proceedings of the Royal Society B (2018)
	Progress in Neuro-Psychopharmacology & Biological Psychiatry (2014)

Psychological Review (2009)
Proceedings of the Royal Society B (2018)

Disease Models & Mechanisms (2019)
Biology Letters (2019)

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