

Joseph Bak-Coleman

PERSONAL DETAILS

Address Department of Ecology and Evolutionary Biology
Guyot Hall
Princeton University
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EDUCATION

Ph.D. Ecology and Evolutionary Biology 2014-Present
Princeton University
Supervisors: Professor Iain Couzin, Professor Dan Rubenstein
Thesis Title: Collective wisdom in the anthropocene

M.A. Ecology and Evolutionary Biology 2016
Princeton University
Supervisors: Professor Iain Couzin, Professor Dan Rubenstein

M.S. Biology 2014
Bowling Green State University
Supervisor: Professor Sheryl Coombs
Thesis Title: The role of the lateral line during rheotaxis

B.S. Neuroscience 2011
Bowling Green State University

MANUSCRIPTS

- 1 M. Grobis, J. Jolles, G Mazué, C Twomey, **J. Bak-Coleman**, D. Rubenstein, and I. Couzin. "Quantifying the spatial distribution of risk in fish schools". In: (prep).
- 2 L. Liang, J. Graving, **J. Bak-Coleman**, and I. Couzin. "Energy savings in freely swimming fish". In: (submitted).
- 3 **J. Bak-Coleman** et al. "Collective behavior in the Anthropocene". In: (prep).
- 4 **J. Bak-Coleman**, J. Sterling, C. Tokita, D. Rubenstein, and I. Couzin. "Collective wisdom on polarized social networks". In: (prep).
- 5 C. Winkylmayr, A. Kao, **Bak-Coleman, J.**, and P. Romanczuk. "The wisdom of stalemates: consensus and clustering as filtering mechanisms for improving collective accuracy". In: (prep).

PUBLICATIONS

- [1] M. Sosna, C. Twomey, **J. Bak-Coleman**, W. Poel, B. Daniels, P. Romanczuk, and I. Couzin. "Structural encoding of perceived risk in fish schools". In: *PNAS* (2019).
- [2] A. Kao, A. Berdahl, A. Hartnett, M. Lutz, **J. Bak-Coleman**, C. Ioannou, X. Giam, and I. Couzin. "Counteracting estimation bias and social influence to improve the wisdom of crowds." In: *Journal of the Royal Society, Interface* 15 (2018).
- [3] A. Chicoli, **J. Bak-Coleman**, S. Coombs, and D.A. Paley. "Rheotaxis performance increases with group size in a coupled phase model with sensory noise: The effects of noise and group size on rheotaxis". In: *European Physical Journal: Special Topics* 224 (2015).

- [4] M. Kulpa, **J. Bak-Coleman**, and S. Coombs. “The lateral line is necessary for blind cavefish rheotaxis in non-uniform flow”. In: *Journal of Experimental Biology* 218 (2015).
- [5] **J. Bak-Coleman**, D. Smith, and S. Coombs. “Going with, then against the flow: Evidence against the optomotor hypothesis of fish rheotaxis”. In: *Animal Behaviour* 107 (2015).
- [6] A Chicoli, S Butail, Y Lun, J Bak-Coleman, S Coombs, and D Paley. “The effects of flow on schooling *Devario aequipinnatus*: school structure, startle response and information transmission”. In: *Journal of fish Biology* (2014).
- [7] **J. Bak-Coleman** and S. Coombs. “Sedentary behavior as a factor in determining lateral line contributions to rheotaxis”. In: *Journal of Experimental Biology* 217 (2014).
- [8] **J. Bak-Coleman**, A. Court, D. Paley, and S. Coombs. “The spatiotemporal dynamics of rheotactic behavior depends on flow speed and available sensory information.” In: *The Journal of experimental biology* 216 (2013).

POPULAR PRESS ARTICLES

Information gerrymandering in social networks skews collective decision-making. *Nature*, 2019

The ignorance of the crowd. *Scientific American*, Nov. 2017

Why did Donald Trump get elected? Ask the bees. *Wired*, Dec. 2016

SEMINARS AND CONFERENCE PARTICIPATION

<i>IC²S²</i> (Amsterdam)	2019
Van Bavel Lab Meeting (New York University)	†2019
Collective Behavior, Social Media and Systemic Risk (Princeton University)	†2018
Yale Institute For Network Science (Yale University)	†2018
Distributed, Collective Computation in Biological and Artificial Systems (Janelia Farm)	2018
Integrated Behavioral Research Group (Princeton University)	2018
Metropolitan Society of Natural Historians (AMNH)	†2016
Integrated Behavioral Research Group (Princeton University)	2016
Animal Behavior Society (Bloomington, IN)	2012
International Congress of Neuroethology (College Park, MD)	2012
Ecological And Evolutionary Ecology of Fishes (Windsor, ON)	2012
J.P. Scott Seminar (BGSU)	2011
Flow Sensing in Air and Water (Bonn, Germany)	†2011
Undergraduate Honors Society Seminar (BGSU)	†2011
SETGO Symposium (BGSU)	2011
J.P. Scott Seminar (BGSU)	2010
	† invited

TEACHING

Guest Lecturer	Princeton University
<i>Comparative Physiology</i>	
2017-2018	
Assistant in Instruction	Princeton University
<i>Comparative Physiology</i>	
<i>Conservation Biology</i>	
<i>Life on Earth: Chaos and Clockwork of Biological Design</i>	
2014-2018	
Instructor	Owens Community College
<i>Introductory Biology</i>	

SERVICE TO PROFESSION

EEB Scholars Host and Speaker, Princeton
 ABRCMS Diversity Recruiter, Indianapolis AZ
 CBSMSR Conference Organizer, Princeton
 Graduate Representative, Princeton
 ABRCMS Diversity Recruiter, Phoenix AZ
 Prospective Student Week Organizer, Princeton
 Behavior Seminar Series Organizer, Princeton
 Graduate Retreat Organizer, Princeton
 President of Biology Graduate Student Association, BGSU

AWARDS AND GRANTS

Travel Award	Flow Sensing in Air and Water
<i>\$2000</i>	
2011	
Summer Research Fellowship	Center for Undergraduate Research and Scholarship
<i>\$2500</i>	
2011	
Summer Research Fellowship	Science, Engineering, Technology Gateway Ohio
<i>\$3500</i>	
2010	
Bioinformatics Scholarship	Choose Ohio First for Bioinformatics
<i>\$4000 per annum</i>	
2009-2011	

TECHNICAL SKILLS

Python	Advanced
Bayesian Inference	Advanced
Machine Learning	Proficient
Qualtrics	Proficient
Mechanical Turk	Proficient
R	Proficient
Computer Vision	Proficient
Matlab	Proficient
Javascript/React	Proficient
Full stack development	Proficient
Deep Learning	Familiar

PEER REVIEW

Animal Behavior
 Biology Open
 Journal of Experimental Biology
 Physics Review Letters
 PLOS Computational Biology
 Proceedings B

REFERENCES

Prof. Iain Couzin

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Konstanz, DE
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Prof. Carl Bergstrom

University of Washington
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Prof. Dan Rubenstein

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