

Anne S. Leonard

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EDUCATION

Postdoctoral Excellence in Research and Teaching Fellow University of Arizona, Center for Insect Science	2008-present
Ph.D. Animal Behavior, University of California, Davis	2008
M.S. Animal Behavior, University of California, Davis	2004
B.A. Biology, Brown University, Providence, Rhode Island <i>Magna cum laude</i> with honors in Biology	2001

GRANTS, FELLOWSHIPS AND AWARDS

Grants

National Science Foundation, Co-P.I. with Daniel Papaj and Anna Dornhaus "Flowers as complex signals: the role of signal uncertainty" (\$420,000)	2009-2012
Research Grant for N.S.F. G.R.F.P. Fellows, UC Davis (\$3,000)	2007
Travel Award, Graduate Student Association, UC Davis (\$500)	2007
Jastro-Shields Research Award, UC Davis (\$1,500)	2003
Undergraduate Research Award, Brown University (\$2,400)	2000

Fellowships

N.I.H. Postdoctoral Excellence in Research and Teaching fellowship (3 years of support)	2008
Professors for the Future, UC Davis (\$3,000)	2007
Internal Fellowship, UC Davis (1 year of support)	2007
National Science Foundation Graduate Research Fellowship (3 years of support)	2004
Eugene Cota-Robles Fellowship, UC Davis (2 years of support)	2002

Awards

Founder's Award for best poster (honorable mention), Animal Behavior Society	2004
Senior Prize in Biology, Brown University	2001
Phi Beta Kappa honor society, Brown University	2000
Sigma Xi honor society, Brown University	2001

RESEARCH EXPERIENCE

"Pollinator learning and the function of multimodal flower signals" Postdoctoral Research, Advisor: Dr. Daniel Papaj Determined how complex floral signals facilitate bumble bee (<i>Bombus impatiens</i>) learning and memory. Experiments on how signal complexity alters the speed vs. accuracy trade-off in decision-making using both free-flying and proboscis extension response (P.E.R) assays.	2008-2011
"Sex-based differences in the integration and use of complex courtship signals" Dissertation, Advisor: Dr. Ann Hedrick Explored how female and male field crickets (<i>Gryllus integer</i>) use chemical and acoustic signals in mate discrimination and identified how age, experience and reproductive state influence these decisions.	2002-2008

"Dragline following preferences of male crab spiders"

1999-2001

Honors Thesis, Advisor: Dr. Douglass Morse

Studied how male crab spiders (*Misumena vatia*) use chemotactile cues on silk draglines to locate females by comparing their responses to draglines of spiders varying in sex, age and species. Completed scanning electron microscope surveys of sensory hairs and spider silks, collected and reared crab spiders.

Laboratory Assistant

2001

Dept. of Environmental Science, Policy and Management, UC Berkeley

Supervisors: Dr. Stephen Welter and Frances Cave

Monitored orchard populations of codling moth (*Cydia pomonella*) for pheromone-based mating disruption experiment, set up pheromone dispersal units, collected specimens and managed data.

PUBLICATIONS

Leonard, A.S., Dornhaus, A. and Papaj, D.R. In press. Why are floral signals complex? An outline of functional hypotheses. In: *Evolution of Plant-Pollinator Relationships*. Patiny, S. ed. Cambridge, UK: Cambridge University Press. *Proof available upon request*.

Leonard, A.S., Dornhaus, A. and Papaj, D.R. 2011. Forget-me-not: complex floral signals, inter-signal interactions and pollinator cognition. *Current Zoology* 57: 215-224.
Invited contribution to special issue on complex signaling.

Leonard, A.S., Dornhaus, A. and Papaj, D.R. 2011. Flowers help bees cope with uncertainty: signal detection and the function of complex floral signals. *Journal of Experimental Biology* 214: 113-121. **Featured as "Must Read" on Faculty of 1000 website**

Leonard, A.S. and A.V. Hedrick. 2010. The role of long-distance versus close-range displays in mating decisions in the field cricket, *Gryllus integer*. *Biological Journal of the Linnean Society* 100: 856-865.

Leonard, A.S. and Hedrick, A.V. 2009a. Males and females use different decision rules in response to mating signals. *Behavioral Ecology* 20: 1175-1184.

Leonard, A.S. and Hedrick, A.V. 2009b. Sex-based differences in mate discrimination: single vs. multiple cues. *Animal Behaviour* 77: 151-159.

Leonard, A.S. and Morse, D.H. 2006. Line-following preferences of male crab spiders, *Misumena vatia*. *Animal Behaviour* 71: 717-724.

SUBMITTED

Leonard, A.S. and Papaj, D.R. "X" marks the spot: The possible benefits of nectar guides to plants and bees.

Kaczorowski, R.L., **Leonard, A.S.**, Dornhaus, A. and Papaj, D.R. Floral signal complexity as a possible adaptation to environmental variability: A test using nectar-foraging bumble bees.

IN PREPARATION

Papaj, D.R, **Leonard, A.S.**, and Dornhaus, A. Speed-accuracy trade-offs and nectar foraging in bees: merging neuroeconomics and optimality theory.

TEACHING EXPERIENCE

Adjunct Assistant Professor , Pima Community College, Tucson AZ BIO 105: Environmental Biology	Spring 2010
Guest Lecturer	
Animal Behavior, Vassar College	2011
Animal Behavior, University of Arizona	2010
Animal Behavior Graduate Group first year seminar	2004-2006
Animal Communication, UC Davis	2006,2007
Sexual Selection seminar, UC Davis	2007,2008
Teaching Assistant , UC Davis	
Animal Behavior	2005
Sexual Selection seminar	2004
Instructor , Fogarty Family Literacy / Olneyville E.S.L. Taught English as a second language to Central American and Haitian immigrants	1998-1999
Specialized Training	
UCD: Seminar in college teaching	2007
UCD: Professional integrity and ethics in the contemporary university	2008
UA: Pedagogy workshop	2010
Undergraduate Mentoring	
Involved ten undergraduates in research projects, highlights include:	
- One winner of both 1 st prize in the UA EEB departmental poster contest and nationally competitive Goldwater fellowship (research proposal-based)	
- One participant in the UA summer Undergraduate Biology Research Program	
- Co-mentoring one student's senior honors thesis research	
Mentor, Women in Science and Engineering program, Brown University	1999-2000

ACADEMIC SERVICE

Professors for the Future Fellow , UC Davis Office of Graduate Studies Selected as one of 12 fellows in competitive campus-wide program intended to develop leadership potential among "outstanding" graduate students. Created campus-wide website and coordinated spring 2008 workshop: "Broader Impacts 101: Strategies for integrating your research with educational outreach."	2007-2008
Animal Behavior Graduate Group , UC Davis	
Advising committee	2007-2008
Core course planning committee	2005-2006
UC Davis representative Colloquium on Civic Engagement and Graduate Study at Research Universities, San Jose, CA	April 2007
Reviewer <i>Proceedings of the Royal Society- Series B</i> (1), <i>Behavioral Ecology</i> (1), <i>Animal Behaviour</i> (3)	

 COMMUNITY ENGAGEMENT

- Workshop Leader and Career Panelist** March 2009, 2010, 2011
 Expanding Your Horizons Conference, UA Women in Science and Engineering Program
 Created interactive workshop "The not-so-secret life of bees: careers in animal behavior" in which female middle-school students observe and collect data on bumble bee behavior. As panelist, shared experiences and requirements for pursuing a career in biological research. Participation featured in article located at:
http://wise.web.arizona.edu/content/expanding_your_horizons_annual_conference
- Founder and coordinator, "Watch It, Don't Squash It"** 2003-2007
 Organized graduate students to form science education group. Created hands-on, invertebrate-focused experiments covering animal behavior, ecology, conservation, and the scientific method. Coordinated twenty 3-hour visits to S.T.A.R.T. program for at-risk youth, Sacramento, CA (2003-2006) and two visits to 3rd grade Spanish immersion classrooms, Cesar Chavez Elementary, Davis, CA.
 Web site: <http://scb.ucdavis.edu/widsi.html>
- Education coordinator, Society for Conservation Biology, Davis chapter** 2006-2007
 Coordinated endangered animal poster exchange project between Bolivian sister chapter and 4th grade Spanish immersion science classes at Cesar Chavez Elementary.
- Providence, R.I. Science Outreach** 2000-2001
 Developed ecology-themed activities and lessons for 5th grade classroom

 PRESENTATIONS

- Leonard, A.S.** Why are floral signals complex? March 2011
 Department of Biology seminar series, New Mexico State University
- Leonard, A.S., Dornhaus, A. and Papaj, D.R.** Flowers help bees cope with uncertainty: Signal detection and the function of complex floral signals.
 International Society for Behavioral Ecology, Perth, Australia September 2010
 Animal Behavior Society meeting, Williamsburg, Virginia July 2010
 Workshop on Insect Learning and Memory, Roscoff, France June 2009
 (F. Mery and T. Preat, organizers)
- Leonard, A.S.** Sex differences in the form and function of responses to mating displays.
 International Society for Behavioral Ecology, Ithaca, New York August 2008
- Leonard, A.S. and A.V. Hedrick.** Sex-based differences in species discrimination: single vs. multiple cues.
 Animal Behavior Society meeting, Burlington, Vermont, July 2007
- Leonard, A.S. and A.V. Hedrick.** Do female field crickets use multiple cues in mate choice?
 Animal Behavior Society meeting, Snowbird, Utah August 2006
- Leonard, A.S. and A.V. Hedrick.** Factors affecting mating selectivity among female field crickets.
 Poster: Animal Behavior Society meeting, Snowbird, Utah August 2005
- Leonard A.S. and D. H. Morse.** Dragline preferences of male crab spiders.
 Poster: Animal Behavior Society meeting, Oaxaca, Mexico June 2004