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Academic Appointments

2019-present Assistant Professor of Data Science
School of information, University of Arizona, Tucson

2019 Adjunct Professor of Data Science
School of information, University of Arizona, Tucson

2015-2019 Postdoctoral Excellence in Research and Teaching Postdoctoral Fellow
Department of Ecology and Evolutionary Biology, University of Arizona, Tucson

2015 Japanese Society for the Promotion of Science Postdoctoral Fellow
Research Institute for Electronic Science, Hokkaido University, Sapporo, Japan

Education

2009-2015 Ph.D. University of California, Davis
Department of Neurobiology, Physiology and Behavior, Animal Behavior Graduate Group
Dissertation title: "*The Role of Species Interactions in Generating and Maintaining Consistent Individual Differences in Behavior*"
Chair: Dr. Ann Hedrick; committee: Drs. Jonathan Pruitt, Andy Sih

2006-2009 B.S. Benedictine University, Biology major, Magna Cum Laude

Fellowships, Grants, and Awards

Since 2008 I have been awarded approximately \$546,000 in grants, awards, and fellowships.

Fellowships

2015-2018 NIH PERT Postdoctoral Fellowship (\$154,000 + benefits)

2015 Izaak Walton Killam Postdoctoral Fellowship (\$73,000 + benefits) (declined)

2015-2016 Japanese Society for the Promotion of Science Postdoctoral Fellowship (\$55,500 + benefits)

2014-2015 UC Davis Dissertation Year Fellowship (\$41,900)

2011-2014 NSF Graduate Research Fellowship (\$132,000)

2013 Japan Society for the Promotion of Science Short-Term Fellowship (\$7500 + benefits)

2013 NSF Graduate Research Opportunities Worldwide Fellowship (\$5000)

- 2012 NSF Nordic Research Opportunity supplement (\$8000)
- 2012 NSF East Asia and Pacific Summer Institute Fellowship (\$14,750 usd + benefits)
- 2008 NSF Research Experience for Undergraduates Fellowship (\$5000 + benefits)

Awards

- 2015 Merton Love Award for most Outstanding Dissertation in Ecology and Evolution: *One given for best dissertation produced in Ecology or Evolutionary Biology at UC Davis in the previous year (\$400).*

Grants

- 2018 International Society for Behavioral Ecology Travel Award (\$500)
- 2018 University of Arizona Center for Insect Science Travel Award (\$600)
- 2017 University of Arizona Center for Insect Science Travel Award (\$1,800)
- 2015 American Arachnological Society Research Grant (\$350)
- 2015 American Society of Naturalists Student Research Fellowship (\$2000)
- 2014 Sigma Xi Grant in Aid of Research (\$700)
- 2014 UC Davis Graduate Student Travel Award (\$500)
- 2012: Orthopterists' Society Research grant - fall (\$560)
- 2012: Orthopterists' Society Research grant - spring (\$614)
- 2011: UC Davis Animal Behavior Graduate Group Fellowship (\$500)
- 2010: UC Davis Animal Behavior Graduate Group Fellowship (\$500)
- 2010: UC Davis Animal Behavior Graduate Group Block Grant (\$34,960)
- 2009: Benedictine University Student Summer Research Grant (\$6000)
- 2008: Council on Undergraduate Research - Biology Division, Travel Award (\$250)
- 2008: Benedictine University Travel Grant (\$500)

Publications

**denotes undergraduate research assistants
*denotes graduate student mentee

- 28: Bradley, C.T.**, Smith, C.A.**, Dornhaus, A, and **N. DiRienzo**. *In Prep*. Testing the behavior-life history relationship in widow spiders.
- 27: **DiRienzo, N.**, Montiglio, P.O., Bradley, C.T.**, and A. Dornhaus. *In Prep*. Understanding the benefits of integrated phenotypes through behavior-extended phenotype interactions.
- 26: Jones, C.*, and **N. DiRienzo**. *In Press*. Game of webs: species and web structure influence contest outcome in black widow spiders.
- 25: **DiRienzo, N.**, Bradley, C.T.**, Smith, C.A.**, and A. Dornhaus. 2019. Bringing down the house: Male widow spiders reduce the webs of aggressive females more. *Behavioral Ecology and Sociobiology*. 73, 1-9.

**Behavioral Ecology and Sociobiology February 2018 Highlight article
Featured on Springer Animal Sciences Facebook Page**

- 24: **DiRienzo, N.**, Johnson, J.C., and A. Dornhaus. 2018. Juvenile disturbance vs. social experience generates differences in variation but not averages. *Behavioral Ecology*. Ary185.
- 23: Jones, C.*, and **N. DiRienzo**. 2018. Patterns of behavioural variation in native and invasive praying mantids and the consequences for foraging. *Behavioural Processes*. 153, 92-99.
- 22: **DiRienzo, N.**, and H. Aonuma. 2018. Plasticity in extended phenotype increases offspring defense despite individual variation in web structure and behaviour. *Animal Behaviour*. 138, 9-17.

Animal Behaviour's April 2018 Editor's Choice award

- 21: **DiRienzo, N.**, and H. Aonuma. 2017. Individual differences are consistent across changes in mating status and mediated by biogenic amines. *Behavioral Ecology and Sociobiology*. 71 (8), 118.
- 20: **DiRienzo, N.**, and A. Dornhaus. 2017. *Temnothorax rugatulus* ant colonies consistently vary in nest structure across time and context. *PLOS One*. 12 (6), e0177598.
- 19: Pruitt, J.N., Bolnick, D.I., Sih, A., **DiRienzo, N.**, and N. Pinter-Wollman. 2016. Behavioral hypervolumes of spider communities predict community performance and disbandment. *Proceedings of the Royal Society B*. 283 (1844), 20161409
- 18: **DiRienzo, N.**, Niemela, P., Hedrick, A., and R. Kortet. 2016. Adult bacterial exposure affects behavioral variation and repeatability in field crickets. *Behavioral Ecology and Sociobiology*. 70(11), 1941-1947.
- 17: Lichtenstein, J.L.L., **DiRienzo, N.**, Knutson, K., Kuo, C., Zhao, K.C., Brittingham, H.A., Geary, S.E., Ministero, S., Rice, H.K., David, Z., Scharf, I., and J.N. Pruitt. 2016. Prolonged food restriction decreases body condition and reduces repeatability in individual personalities in web-building spiders. *Behavioral Ecology and Sociobiology*. 70(11), 1793 - 1803.
- 16: Montiglio, P.O., and **N. DiRienzo**. 2016. There's no place like home: the contribution of direct and extended phenotypes on the expression of spider aggressiveness. *Behavioral Ecology*. 27 (6): 1880-1888.
- 15: **DiRienzo, N.**, and P.O. Montiglio. 2016. Linking consistent individual differences in web structure and behavior in black widow spiders. *Behavioral Ecology* 27.5: 1424-1431
* Both authors contributed equally to this publication
- 14: **DiRienzo, N.**, and P.O. Montiglio. 2016. The contribution of developmental experience vs. condition on life history, trait variation, and individual differences. *Journal of Animal Ecology*. 85(4): 914-926.
- 13: **DiRienzo, N.**, McDermott, D.**, and J. Pruitt. 2015. Testing the effects of biogenic amines and alternative topical solvent types on the behavioral repertoire of two web-building spiders. *Ethology*. 121: 1-12.
- 12: **DiRienzo, N.**, Niemela, P., Skog, A.**, Hedrick, A., and R. Kortet. 2015. Juvenile pathogen exposure affects the presences of personality in adult field crickets. *Frontiers in Ecology and Evolution*. 3: 36.
- 11: **DiRienzo, N.**, and P.O. Montiglio. 2015. Four ways in which data-free papers fail to be impactful. *Frontiers in Ecology and Evolution*. 3: 23.
* Both authors contributed equally to this publication
- 10: **DiRienzo, N.**, and A. Hedrick. 2014. Animal personalities and their implications for complex signaling. *Current Zoology*. 60(3): 381-386.

- 9: McDermott, D.** , Chips, M., McGuirk, M.** , Armagost, F.** , **DiRienzo, N.**, and J. Pruitt. 2014. Boldness is influenced by sub-lethal interactions with predators and is associated with successful harem infiltration. *Behavioral Ecology and Sociobiology*. 68(3): 425-435.
- 8: **DiRienzo, N.**, Pruitt, J.N., and A. Hedrick. 2013. The combined behavioral tendencies of predator and prey mediate the outcome of their interaction. *Animal Behaviour*. 86: 317-322.
- 7: Sweeney, K.** , Gadd, R.D.H.** , Hess, Z.L.** , McDermott, D.** , MacDonald, L., Cotter, P., Armagost, F.** , Chen, J.Z**., Berning, A.W.** , **DiRienzo, N.**, and J.Pruitt. 2013. Assessing the effects of rearing environment, natural selection, and developmental stage on the emergence of a behavioral syndrome. *Ethology*. 119: 436-447.
- 6: Marshall, J., and **N. DiRienzo**. 2013. Noncompetitive gametic isolation between sibling species of cricket: A hypothesized link between within-population incompatibility and reproductive isolation between species. *International Journal of Evolutionary Biology*. dx.doi.org/10.1155/2012/593438.
- 5: **DiRienzo, N.**, and J. Marshall. 2013. Function of the hemolymph nuptial gift in the southern ground cricket, *Allonemobius socius*. *Ethology*. 119: 104-109.

Featured in Science News, February 9, 2013, p. 4

- 4: **DiRienzo, N.**, Pruitt, J.N., and A. Hedrick. 2012. Juvenile exposure to acoustic sexual signals from conspecifics alters developmental trajectory and adult personality. *Animal Behaviour* 84: 861-868.

Featured in BBC Nature News: <http://www.bbc.co.uk/nature/19248230>

- 3: Niemela, P., **DiRienzo, N.**, and A. Hedrick. 2012. Predator-induced changes in the boldness of naïve field crickets, *Gryllus integer*, depends on behavioural type. *Animal Behaviour* 84: 129-135.
- 2: Sih, A., Bibian, A., **DiRienzo, N.**, Meng, X.X., Montiglio, P.O., and K. Ringelman. 2012. On the benefits of studying mechanisms underlying behavior. In P. Crowley, T. Zentall, eds., *Comparative decision making*. Oxford University Press.
- 1: Pruitt, J.N., **DiRienzo, N.**, kralj-Fišer, S., Johnson, J.C., and A. Sih. 2011. Individual- and condition- dependent effects on habitat choice and choosiness. *Behavioral Ecology and Sociobiology* 65: 1987-1995.

Publically Archived Datasets

- 1: **DiRienzo, N.**, and P.O. Montiglio. 2016. Data From: The contribution of developmental experience vs. condition on life history, trait variation, and individual differences. Dryad Digital Repository, <http://dx.doi.org/10.5061/dryad.25m47>.
- 2: **DiRienzo, N.**, and H. Aonuma. 2017. Data From: Individual differences are consistent across changes in mating status and mediated by biogenic amines. Dryad Digital Repository. doi:10.5061/dryad.8tf05

Invited Research Seminars

2018: University of Arizona: Entomology seminar series

2018: University of Quebec at Montreal: Invited seminar in the Department of Biological Sciences

- 2017: Ludwig-Maximilians-Universität München: Invited seminar in the Department of Biology II
- 2017: Max Planck Institute for Ornithology: Invited seminar in the Department of Collective Behaviour
- 2017: Ball State University: Department of Biology seminar series
- 2016: University of North Carolina, Chapel Hill: EEOB "Lunch Bunch" seminar series
- 2016: University of Arizona: Entomology seminar series
- 2016: Rice University: Ecology and Evolution seminar series
- 2016: University of Toronto: Invited seminar in the Department of Biological Sciences
- 2016: Annual University of Arizona Center for Insect Science Hexapodium
- 2015: Hokkaido University: Invited seminar in the Department of Biological Science
- 2015: University of Tokyo: Invited seminar in the Department of General Systems Studies
- 2015: Kobe University: Invited seminar in the Department of Biology
- 2015: University of California, Davis Evolution and Ecology Seminar Series Merton Love Award Seminar: Given by PhD student with the most outstanding dissertation in ecology or evolutionary biology completed in the previous year.
- 2015: University of California, Berkeley, Essig Brunch Seminar Series
- 2015: University of Massachusetts, Amherst, Darwin Fellowship Seminar Series

Contributed Presentations and Posters

- 2018: **DiRienzo, N.** and A. Dornhaus, Oh what a tangled web: How individual variation in the extended phenotype and behavior interact to determine foraging success. International Society for Behavioral Ecology, Minneapolis, Minnesota.
- 2018: **DiRienzo, N.** and A. Dornhaus, Oh what a tangled web: How individual variation in the extended phenotype and behavior interact to determine foraging success. 55th Animal Behavior Society Meeting, Milwaukee, Wisconsin.
- 2018: **DiRienzo, N.** Individual variation in the extended phenotype: consequences of development and contributions to foraging. University of Arizona Department of Ecology and Evolutionary Biology Noon Seminar, Tucson, AZ, USA.
- 2017: **DiRienzo, N.** and A. Dornhaus, Ontogenetic cues of density vs. disturbance drive different patterns of variation in widow spiders. 35th International Ethological Conference, Estoril, Portugal.
- 2017: **DiRienzo, N.** and A. Dornhaus, Ontogenetic cues of density vs. disturbance drive different patterns of variation in widow spiders. 54th Animal Behavior Society Meeting, Toronto, Canada.
- 2016: **DiRienzo, N.** The role of development vs. state in driving individual differences in behavior and the extended phenotype. University of Arizona Department of Ecology and Evolutionary Biology Noon Seminar, Tucson, AZ, USA.
- 2016: **DiRienzo, N.**, and P.O. Montiglio. *Developmental experience shapes life history, behavior, and web structure of black widows*. 53th Animal Behavior Society Meeting, Columbia, MO, USA. **Part of the Walder Clyde Allee Symposium**

- 2016: **DiRienzo, N.**, and P.O, Montiglio. *Developmental experience shapes life history, behavior, and web structure of black widows*. 20th International Congress of Arachnology, Golden, CO, USA.
- 2015: **DiRienzo, N.**, and P.O, Montiglio. *Developmental experiences drives consistent individual differences in foraging aggression and web structure in the western black widow, *Latrodectus hesperus**. UC Davis Regional Animal Behavior Conference, Davis, CA, USA.
- 2014: **DiRienzo, N.**, and A. Hedrick. *Animal personalities and their implications for complex signaling*. 51st annual meeting of the Animal Behavior Society, Princeton, NJ, USA.
- 2013: **DiRienzo, N.**, Niemela, P., Hedrick, A., and R. Kortet. *Juvenile exposure to pathogens affects the presence of personality in field crickets*. 50th annual meeting of the Animal Behavior Society, Boulder, CO, USA.
- 2013: **DiRienzo, N.**, Pruitt, J.N., and A. Hedrick. *Combined behavioral tendencies of predator and prey mediate the outcome of their interaction*. UC Davis Regional Animal Behavior Conference, Davis, CA, USA.
- 2012: **DiRienzo, N.**, Pruitt, J.N., and A. Hedrick. *Combined behavioral tendencies of predator and prey mediate the outcome of their interaction*. 16th annual Kaamos Symposium, Oulu, Finland.
- 2011: **DiRienzo, N.**, Pruitt, J.N., and A. Hedrick. *Exposure to acoustic sexual signals alters adult personality in the field cricket, *Gryllus integer**. 48th annual meeting of the Animal Behavior Society, Bloomington, IN, USA.

Teaching Experience

Associate instructor

- 2019 Senior Capstones
 ISTA 498, University of Arizona, Tucson, Arizona
 Upper-level undergraduate course, enrollment ~ 40-80 students
- Data Mining and Discovery
 ISTA 321, University of Arizona, Tucson, Arizona
 Upper-level undergraduate course, enrollment ~ 35 students
- Intro to Data Science
 ESOC 214, University of Arizona, Tucson, Arizona
 Lower-level undergraduate course, enrollment ~ 35 students
- 2016 General Biology II - for majors
 BIO 182, Pima Community College, Tucson, Arizona
 Lower-level undergraduate course, enrollment ~ 20 students
- 2014 *Animal Behavior*
 NPB 102, University of California, Davis
 Upper-level undergraduate class, enrollment ~ 120 students

Guest Lecturer

- 2016 *Animal Personalities: Concepts and consequences*
Animal Behavior, ECL 487, University of Arizona, Tucson
- 2013 *Sexual Selection and Animal Personalities*
Introduction to Biology, BIOL 1108, University of Georgia, Athens
- 2010 *The Fitness Implications of Animal Personalities*
Animal Behavior, BIOL 370, Benedictine University, Lisle, Illinois

Statistics Lessons

- 2016 *Dealing with overdispersion in R; AIC and other IT approaches*
EEB Stats and R workgroup, University of Arizona, Tucson

Teaching Assistant

- 2010-14 BIS 2B, Introduction to Biology: Principles of Ecology and Evolution, University of California, Davis
- 2011 BIS 2C, Introduction to Biology: Biodiversity and the Tree of Life, University of California, Davis
- 2010 ANS 18, Introduction to Aquaculture, University of California, Davis

Pedagogical Training

- 2018 Participated in a 1-day active learning workshop with Dr. Ed Prather at University of Arizona
- 2017 Participated in a 2-day POGIL workshop hosted by the PERT program
- 2016 Participated in a 2-day active learning workshop with Dr. Ed Prather at University of Arizona

Relevant Teaching Skills

- Developed lessons intended to address specific student learning outcomes
- Created tests and quizzes to assess student learning outcomes
- Developed formative assessments
- Developed interactive classroom activities intended to connect science to students' lives
- Use cyber learning environments to distribute materials and engage students
- Use a variety of multimedia sources in interactive lessons

Mentoring Experience

- 2016-present Research mentor for 15 UA undergraduate students. Their duties vary from data collection, analysis, developing new experimental procedures and tools. Students present research results at the University of Arizona Ecology and Evolution Undergraduate Research Symposium.
- 2010-2015 Research mentor for 14 undergraduates and four graduate students affiliated with Ann Hedrick's lab at UC Davis and the Kortet lab at the University of Oulu, Finland. As a mentor I taught research methods, experimental design, data collection and statistical analysis. Additional mentoring of undergraduate and

graduate student researchers in the Pruitt lab at Pittsburgh University. Several of my research students have been co-authors on my research papers (see publication section).

Outreach Activities

- 2017-2018 Provided lab tours and research discussions for the Arizona Science, Engineering, and Math Scholars
- 2017 & 2018 Developed a display for the Arizona Insect Festival, an event that draws several thousand people, that taught children and adults how development shapes behavior and the role of extended phenotypes in behavior.
- 2018 Created and presented a display at the Desert Shadows Middle School's Science Night in Nogales, Arizona. My display included visual information on the form and function of different spider web types along with live demonstrations of how behavior and web structure interact.
- 2017 Monthly speaker for the Arizona Science, Engineering, and Math Scholars, a program that introduces underrepresented and first generation college students to science research via workshops and hands-on experience. I have been speaking about life as a graduate student, how to get into graduate school, what comes after graduate school, etc.
- 2017 Mentor for the Arizona Science, Engineering, and Math Scholars. Specifically, I spent a year working with a first generation and underrepresented college student helping him develop his own research project and teaching him about navigating academia in general.
- 2017 Provided lab tours and research discussions to University of Arizona Flynn Scholars
- 2016 Co-creator of the NIH Institutional Research and Academic Career Development Awards (IRACDA) listserv. The listserv connects the 200+ IRACDA postdoctoral fellows across institutions in order to provide support, share resources, and give insight into topics related to diversity and inclusion in aspiring scientists.
- 2015 Served as visiting scientist for middle and high school students at the International School in Sapporo, Japan. My duties included leading a lesson on spider foraging behavior and classroom experiments on variation in foraging behavior in the redback spider, *Latrodectus hasselti*.
- 2014 Engaged in outreach activities at Sacramento-area high schools. These activities included presenting to science clubs and classes regarding the role of research scientists, the life of a graduate student, and alternative careers in science.
- 2009-2014 Mentor for the Student and Landowner Education and Watershed Stewardship program for the Center for Landbased Learning. This long standing program engages high school students in habitat restoration projects to enhance classroom learning.
- 2011 Co-chair of the UC Davis outreach program Watch it Don't Squash it (WIDSI), which partners UCD graduate students with local underprivileged K-12 schools to integrate graduate research into their curriculum via interactive projects.

Academic Service

Learning Community

- 2016 Founded a workgroup at the University of Arizona that focuses on developing National Science Foundation Graduate Research Fellowship applications. The workgroup meets weekly to develop the specific grant components in a structured fashion while giving continual feedback on individuals' grant proposals.
- 2016 Co-founded the University of Arizona Ecology and Evolution Statistics and R Group. The group is open to all members of the department and we meet weekly to address issues related to statistical methodology, study design, and analyzing data in R. Resource sharing among participants is encouraged via online repositories and a dedicated mailing list.

Committee Work

- 2019 Search committee for new associate professor of Data Science at the U Arizona iSchool
- 2016-2018 Head PERT Postdoctoral Fellow. Leadership role; responsible for leading community building efforts amongst postdoctoral fellows.
- 2017 Served on the PERT hiring committee. This included reviewing and ranking applications, one-on-one and group interviews, and working with the 7-person committee to select what applications received offers.
- 2016 Organizing member for the 2016 Institutional Research and Academic Career Development Award (IRACDA) conference
- 2011-2012 Graduate student adviser for incoming graduate students to the UC Davis Animal Behavior Graduate Group

Membership in Professional Societies

American Arachnological Society, American Society of Naturalists, Animal Behavior Society, Japanese Society for the Promotion of Science Alumni Association, Orthopterists' Society

Peer Reviewer

American Naturalist (1), Animal Behaviour (10), Behavioral Ecology (7), Behavioral Ecology and Sociobiology (5), Behavioral Processes (1), Biology Letters (1), Current Zoology (1), Ethology (5), Frontiers in Ecology and Evolution (1), Journal of Animal Ecology (6), Journal of Arachnology (1), Journal of Insect Behavior (2), PeerJ (1)

Grant Reviewer

Animal Behavior Society Student Research Grants 2015, 2016, 2017

References

Available on request