

Christopher Allen Varnon

Department of Psychology
Comparative Neurobiology Program
Oklahoma State University
116 N. Murray, OSU
Stillwater, OK 74078

EDUCATION

- 2013-Present Ph.D. Psychology (ABD. Expected graduation – May, 2017)
Oklahoma State University, Stillwater, OK
Dissertation: The propeller experiment controller: Affordable automation
for behavioral research
Advisor: Charles I. Abramson
GPA 3.9
- 2013 M.S. Psychology
Oklahoma State University, Stillwater, OK
Thesis: Sexual conditioning in human-imprinted pigeons (*Columba livia*)
Advisor: Charles I. Abramson
GPA 3.9
- 2011 M.S. Behavior Analysis
University of North Texas, Denton, TX
Thesis: Operant analysis of imprinting in a human-reared pigeon
Advisor: Jesús Rosales-Ruiz
GPA 4.0
- 2007 B.S. Biology and Psychology (double major)
Jacksonville State University, Jacksonville, AL
Hon Cum Laude
Advisor: William L. Palya
GPA 3.6

GRANTS, FELLOWSHIPS & AWARDS

- 2014 Research and Scholarship Award, Oklahoma State University Department
of Psychology
- 2013 Journal of Experimental Biology Article Highlight
Stead. N. (2013). Learning in workers and Drones. *Journal of
Experimental Biology*, 216, iii. doi: 10.1242/jeb.096339

- 2013 Provost Research Teaching Grant, Oklahoma State University
- 2012 International Development Grant, Society for the Advancement of Behavior Analysis
- 2012 Marian Breland-Bailey Award, Applied Animal Behavior Special Interest Group of the Association for Behavior Analysis International
- 2012 Niblack Research Scholar Graduate Student Mentor, Oklahoma State University
- 2012 Sigma Xi Grants in Aid of Research
- 2011 James L. Kopp Memorial Scholarship, Texas Association for Behavior Analysis
- 2011 Douglas P. Field Scholarship, University of North Texas
- 2008-2010 BEHV Graduate Fellowship, University of North Texas

PUBLICATIONS

- Place, A. J., **Varnon, C. A.**, Craig, D. P. A., & Abramson, C. I. (2017). Exploratory investigations in operant thermoregulation in western diamond-backed rattlesnakes (*Crotalus atrox*). In M. J. Dreslik, W. K. Hayes, S. J. Beaupre, & S. P. Mackessy (Eds.), *The Biology of Rattlesnakes* (pp. 213-227). Rodeo, NM: ECO Herpetological Publishing and Distribution.
- Craig, D. P. A., **Varnon, C. A.**, Pollock*, K. L., & Abramson, C. I. (2015). An assessment of horse (*Equus ferus caballus*) responding on fixed interval schedules of reinforcement: An individual analysis. *Behavioural Processes*, *120*, 1-13. Impact Factor = 1.32.
- Abramson, C. A., Craig, D. P. A., **Varnon, C. A.**, & Wells, H. (2015). The effect of ethanol on reversal learning in honey bees (*Apis mellifera anatolica*): Response inhibition in a social insect model. *Alcohol*, *49*, 245-258. doi: <http://dx.doi.org/10.1016/j.alcohol.2015.02.005>. Impact Factor = 2.44.
- Craig, D. P. A., **Varnon, C. A.**, Sokolowski, M. B. C., Wells, H., & Abramson, C. I. (2014). An assessment of fixed interval timing in free-flying honey bees (*Apis mellifera ligustica*): An analysis of individual performance. *PloS One*, *9*, e101262. doi:10.1371/journal.pone.0101262. Impact Factor = 3.54.

Dinges*, C. W., Avalos, A., Abramson, C. I., Craig, D. P. A., Austin*, Z. M., **Varnon, C. A.**, Nur Dal*, F., Giray, T., & Wells, H. (2013). Aversive conditioning in honey bees (*Apis mellifera anatolica*): A comparison of drones and workers. *Journal of Experimental Biology*, 216, 4124-4134. doi:10.1242/jeb.090100. Impact Factor = 2.90.

Varnon, C. A., & Abramson, C. I. (2013). The propeller experiment controller: Low-cost automation for classroom experiments in learning and behavior. *Comprehensive Psychology*, 2, 1-18. doi:10.2466/07.08.IT.2.2

Abramson, C. I., Lay*, A., Bowser, T. J., & **Varnon, C. A.** (2012). The use of silver vine (*Actindia Polygama maximum*, family Actindiaceae) as an enrichment aid for felines: Issues and prospects. *American Journal of Animal and Veterinary Sciences*, 7, 21-27. doi:10.3844/ajavsp.2012.21.27

Craig, D. P. A., Grice, J. W., **Varnon, C. A.**, Gibson*, B., Sokolowski, M. B C., & Abramson, C. I. (2012). Social reinforcement delays in free-flying honey bees (*Apis mellifera* L.). *PloS One*, 7, e46729. doi:10.1371/journal.pone.0046729. Impact Factor = 3.54.

Varnon, C. A., Martin*, A. L., & Abramson, C. I. (2012). Conditioning methods for farm animals: A mini review. *Uludağ University Journal of the Faculty of Veterinary Medicine*, 2, 1-10.

* Undergraduate coauthor.

MANUSCRIPTS SUBMITTED

Dinges, C. W., **Varnon, C. A.**, Cota, L. D., Slykerman*, S. C., & Abramson, C. I. (*submitted*). Studies of learned helplessness in honey bees (*Apis mellifera* L.). Submitted to *Journal of Experimental Psychology: Animal Learning and Cognition*.

* Undergraduate coauthor.

MANUSCRIPTS IN PREPERATION

Varnon, C. A., & Abramson, C. I. (*in prep.*). The propeller experiment controller: A powerful, inexpensive experiment controller for behavioral research. Manuscript in preparation for the *Journal of Visualized Experiments*.

Varnon, C. A., & Abramson, C. I. (*in prep.*). Sexual conditioning in human-imprinted pigeons (*Columba livia*).

Varnon, C. A., Black, T., & Abramson, C. I. (*in prep.*). Taste aversion learning in honey bees (*Apis mellifera*): Bees do not learn conditioned aversions to ethanol.

Varnon, C. A., Dandy*, M. L., Dinges, & Abramson, C. I. (*in prep.*). Habituation of the disturbance hiss in hissing cockroaches (*Gromphadorhina portentosa*): Effects of temperature, sex, and temperament.

Varnon, C. A., Vest*, A. J., Dinges, C. W., & Abramson, C. I. (*in prep.*). Aversive conditioning in honey bees with social discriminative stimuli.

* Undergraduate coauthor.

INVITED PRESENTATIONS

Varnon, C. A., & Abramson, C. I. (2013, August). The propeller experiment controller: Low-cost automation for research and classroom experiments in learning and behavior. Invited presentation for the Instituto Federal de Educação, Ciência e Tecnologia da Paraíba Campus Cajazeiras, Cajazeiras, PB, Brazil.

Varnon, C. A., & Abramson, C. I. (2013, August). The propeller experiment controller: Low-cost automation for research and classroom experiments in learning and behavior. Invited presentation for the Instituto Federal de Educação, Ciência e Tecnologia da Paraíba Campus João Pessoa, João Pessoa, PB, Brazil.

Varnon, C. A., & Abramson, C. I. (2013, August). The propeller experiment controller: Low-cost automation for research and classroom experiments in learning and behavior. Invited presentation for the Instituto Federal de Educação, Ciência e Tecnologia da Paraíba Campus Sousa, Sousa, PB, Brazil.

Varnon, C. A., & Abramson, C. I. (2013, March). Affordable automation: The propeller experiment controller for research, teaching, and application of behavior analysis. Invited presentation for University of North Texas Department of Behavior Analysis, Denton, TX.

PRESENTATIONS

Varnon, C. A., Dinges, C. W., & Abramson, C. I. (2016, May). Social discriminate stimuli in aversive conditioning in honey bees. Presented at the annual meeting of the Association for Behavior Analysis International, Chicago, IL.

- Dinges, C., **Varnon, C. A.**, Craig, D. P. A., Abramson, C. I., Avalos, A., & Tugrul, G. (2015, May) Aversive conditioning in honey bees: Influence of master/yoked role reversal in place preference conditioning. Presented at the annual meeting of the Association for Behavior Analysis International, San Antonio, TX.
- Phelps, B. J., & **Varnon, C. A.** (2015, May). Using a microprocessor-controller for measures of foraging behavior by free roaming eastern fox squirrels *Sciurus niger*. Poster presented at the annual meeting of the Association for Behavior Analysis International, San Antonio, TX.
- Varnon, C. A.**, Craig, D. P. A., Place, A. J., & Abramson, C. I. (2015, May). Operant conditioning in snakes: Temperature change as a reinforcer. Presented at the annual meeting of the Association for Behavior Analysis International, San Antonio, TX.
- Varnon, C. A.**, Dinges, C. W., & Abramson, C. I. (2015, May). Affordable custom research equipment using 3D printers and the propeller experiment controller. Poster presented at the annual meeting of the Association for Behavior Analysis International, San Antonio, TX.
- Place, A. J., **Varnon, C. A.**, Craig, D. P. A., & Abramson, C. I. (2014, June). Investigations in learning arbitrary behaviors to thermoregulate in rattlesnakes (*Crotalus atrox* and *Crotalus horridus*). Poster session presented at the second meeting of the Biology of the Pitvipers, Tulsa, OK.
- Craig, D. P. A., Grice, J., **Varnon, C. A.**, Sokolowski, M., & Abramson, C. I. (2014, May). The impact of reinforcement delays on honey bee (*Apis mellifera* L.) operant responding. Presented at the annual meeting of the Association for Behavior Analysis International, Chicago, IL.
- Dinges, C., Abramson, C. I., Craig, D. P. A., Austin*, Z. M., **Varnon, C. A.**, Nur Dal*, F., Giray, T., & Wells, H. (2014, May). Aversive conditioning in honey bees (*Apis mellifera antolica*): A comparison of drones and workers. Presented at the annual meeting of the Association for Behavior Analysis International, Chicago, IL.
- Varnon, C. A.**, & Abramson, C. I. (2014, May). Issues in the study of invertebrate learning. Presented at the annual meeting of the Association for Behavior Analysis International, Chicago, IL.
- Varnon, C. A.**, & Abramson, C. I. (2014, May). Stimulating research in comparative psychology with the affordable propeller experiment controller. Poster session presented at the annual meeting of the Association for Behavior Analysis International, Chicago, IL.
- Craig, D. P. A., **Varnon, C. A.**, & Abramson, C. I. (2013, May). Fixed interval performance in free-flying honey bees (*Apis mellifera* L.): An analysis of individual performance. Poster session presented at the annual meeting of the Association for Behavior Analysis International, Minnesota, MN.

Varnon, C. A., & Abramson, C. I. (2013, May). Affordable automation: The parallax propeller microcontroller as device for research, teaching, and application of behavior analysis. Presented at the annual meeting of the Association for Behavior Analysis International, Minnesota, MN.

Varnon, C. A., Craig, D. P. A., Place, A. J., & Abramson, C. I. (2012, May). Issues in operant learning in rattlesnakes. Poster session presented at the annual meeting of the Association for Behavior Analysis International, Seattle, WA.

Varnon, C. A., Rosales-Ruiz, J., Abramson, C. I., & Long*, S. (2012, May). Operant analysis of imprinting in human-reared pigeons. Presented at the annual meeting of the Association for Behavior Analysis International, Seattle, WA.

Chicas-Mosier*, A., **Varnon, C. A., & Abramson, C. I.** (2012, April). A new training technique to study learning in planarians. Presented at the annual Oklahoma Psychological Society Spring Research Conference, Edmund, OK.

Dinges*, C., **Varnon, C. A., & Abramson, C. I.** (2012, April). Cued avoidance in honey bees (*Apis mellifera*): An active avoidance assay proposal. Presented at the annual Oklahoma Psychological Society Spring Research Conference, Edmund, OK.

Varnon, C. A., & Abramson, C. I. (2012, April). Sexual conditioning in human-imprinted pigeons. Presented at the annual Oklahoma Psychological Society Spring Research Conference, Edmund, OK.

Varnon, C. A., Craig, D. P. A., Place, A. J., & Abramson, C. I. (2012, April). Issues in operant learning in rattlesnakes. Presented at the annual Oklahoma Psychological Society Spring Research Conference, Edmund, OK.

Varnon, C. A., & Rosales-Ruiz, J. (2011, May). Operant control of imprinting. Poster session presented at the annual meeting of the Association for Behavior Analysis International, Denver, CO.

* Undergraduate co-presenter.

CONVENTION SYMPOSIUMS ORGANIZED

2016 Symposium Chair. Experimental Analysis of Invertebrate Behavior. Association for Behavior Analysis International, Chicago, IL.

2015 Symposium Co-chair. Operant Conditioning in Invertebrates. Association for Behavior Analysis International, San Antonio, TX.

- 2014 Learning in Invertebrate Subjects: New Avenues for Behavior Analysis
Association for Behavior Analysis International, Chicago, IL.
- 2012 Symposium Chair. Contingencies of Natural and Social Reinforcement in
Animals. Association for Behavior Analysis International, Seattle, WA.

CURRENT RESEARCH COLABORATIONS

Time allocation and response effort for wild, free-ranging eastern fox squirrels (*Sciurus Niger*) at automated feeders

Collaboration with Dr. Brady Phelps, South Dakota State University

Development of a portable, automated apparatus to study learning and cognition in dogs

Collaboration with Dr. Kathryn Kalafut, Antioch College and Dr. Erica Feuerbacher, Carroll College

Functional analysis of the effect of rattlesnake rattles on native wildlife using automated techniques

Collaboration with Dr. Aaron Place, Northwestern Oklahoma State University

TEACHING EXPERIENCE

Oklahoma State University

Instructor. Introductory Psychology (2012-2015, 12 sections)

Instructor. Neurobiological Psychology (2015-2016, 3 sections)

Instructor. Comparative Psychology (2015, 1 section)

Instructor. Quantitative Methods in Psychology Lecture (2015, 1 section)

Instructor. Quantitative Methods in Psychology Laboratory (2013, 1 section)

Teaching Assistant. Personality (2016, 1 section)

Teaching Assistant. Clinical Child Psychology (2013, 1 section)

Teaching Assistant. Developmental Psychology (2013, 1 section)

University of North Texas

Teaching Assistant. Building Skills with Behavior Technology (2012, 1 section)

Teaching Assistant. Behavior Principles I (2008, 1 section)

Jacksonville State University

Teaching Assistant. Principles of Behavior Analysis Laboratory (2007, 2 sections)

UNIQUE TEACHING SKILLS

Online Teaching

I have experience designing online material for courses. In addition to using online classroom tools, I have filmed and edited lectures to create online videos as a supplement for class, or to be used in a full flipped classroom.

Experimental Psychology Laboratory

I developed an inexpensive conditioning and learning laboratory for undergraduate or graduate students. The laboratory involves twenty experiments in habituation, classical conditioning and operant conditioning, and utilizes my Propeller Experiment Controller software to provide automatic control of variables and data spreadsheets. Experiments are suitable for a wide variety of human and animal subjects including inexpensive, low maintenance invertebrate species. I am presently expanding this laboratory to include experiments and demonstrations in other areas of psychology such as psychophysics and neuropsychology.

Comparative Interdisciplinary Experience

My research and background in both biology and psychology promotes interdisciplinary teaching and research. Additionally, my experience in husbandry and training of a wide range of species through research at Oklahoma State University and work at institutions such as the Anniston Museum of Natural History, Birmingham Zoo, Dallas Zoo, Fort Worth Zoo, Frank Buck Zoo, and Heard Natural Science Museum and Wildlife Sanctuary provides a unique comparative perspective in courses relating to animals or behavior.

Outreach

My teaching experience also extends outside of the classroom. I have given many educational presentations on natural history, conservation, and behavior at several zoos and wildlife facilities. Additionally, at the Heard Natural Science Museum I was part of a consulting group that trained the staff about husbandry and animal training of their newly acquired exotic animal collection. Finally, at Frank Buck Zoo, I developed a rodent training course for the summer teen volunteer program to provide the volunteers hands-on learning about animal behavior and the principles of reinforcement.

UNDERGRADUATE MENTORSHIP

Amber Mitchell¹ (Fall, 2016) The effect of introductory text book cover images on student perception of academic rigor in natural and social science courses.

Tabatha Lewis² (Fall, 2016) Comparison of individual and communal housing techniques on the longevity and ethanol consumption of captive honey bees.

Melissa L. Dandy (Fall, 2014 - Spring, 2015) Habituation of the defensive hiss in hissing cockroaches (*Gromphadorhina portentosa*): Effects of temperature, sex, and temperament. Manuscript in preparation.

J. Adam Vest² (Fall, 2013 - Summer, 2016) Aversive conditioning in honey bees with social discriminative stimuli. Manuscript in preparation.

Amber Douglas¹ (Spring, 2012 - Fall, 2013) Learning in bioluminescent algae. Co-recipient of a Niblack Research Scholarship. Current medical student at Oklahoma State University.

Christopher W. Dinges (Fall, 2011 - Fall, 2013) Aversive conditioning in honey bees (*Apis mellifera anatolica*): A comparison of drones and workers. Project published. Current Experimental Psychology PhD student at Oklahoma State University. Recipient of NSF Graduate Research Fellowship.

Shellyn L. Long (Fall, 2012) Sexual conditioning in human-reared pigeons. Manuscript in preparation.

Ana C. Mosier¹ (Spring, 2012) New techniques to study learning in black and brown planarians. Project published. Current Zoology PhD student at Oklahoma State University. Recipient of NSF Graduate Research Fellowship.

¹ Notes minority student.

² Notes non-traditional student.

PROFESSIONAL AFFILIATIONS

2011-Present	Association for Behavior Analysis International Applied Animal Behavior Special Interest Group Behavior Analysis and Technology Special Interest Group
2012	Oklahoma Psychological Society
2008-2011	Organization for Reinforcement Contingencies with Animals, University of North Texas
2011	Texas Association for Behavior Analysis
2007	South Eastern Association for Behavior Analysis Society of Quantitative Analysis of Behavior Invited Lecture Video Editor

EDITORIAL SERVICE

2015-Present Reviewer for *Journal of Social Sciences*

2013-2016 Reviewer for *Innovative Teaching*

TECHNOLOGICAL SKILLS

Programming languages
Python, C++, C#, Spin

Parallax propeller microcontroller

Scientific and statistical analysis packages
SciPy, R, SPSS, SAS

3D Printing and printer maintenance

Multimedia editing programs
Avid, Camtasia, Final Cut, Audacity

SketchUp 3D modeling software

Website design

Unity 3D software engine

Embedded electronics

Experimental equipment design and construction