

CARRIE C. VEILLEUX – CURRICULUM VITAE

Anthropology & Archaeology
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AREAS OF SPECIALIZATION

sensory ecology, molecular ecology, primate genetics, primate evolution

APPOINTMENTS

2017-18 Postdoctoral Scholar, Anthropology and Archaeology, University of Calgary
2012-18 Postdoctoral Research Affiliate, Anthropology, University of Texas at Austin
2015-17 Lecturer, Anthropology, Texas State University
2015-16 Postdoctoral Fellow, American Association of University Women
2013 Postdoctoral Research Associate, Anthropology, Yale University
2007-11 Teaching Assistant, Anthropology, University of Texas at Austin

EDUCATION

Ph.D. Biological Anthropology, University of Texas at Austin, May 2012.
Dissertation: *Effects of light environment on the evolution of primate visual systems*.
Advisor: E. Christopher Kirk

M.A. Biological Anthropology, University of Texas at Austin, 2006.
Thesis: *Visual acuity in a cathemeral lemur (Eulemur macaco flavifrons): implications for strepsirrhine visual ecology*. Advisor: E. Christopher Kirk

B.A. Anthropology, Psychology minor, Barrett Honors College, Arizona State University, 2004.
Advisor: Leanne T. Nash

HIGH-IMPACT RESEARCH CONTRIBUTIONS

1. *Evolution of primate sensory genes*. My major research focus is using population genomic and phylogenetic approaches to explore the evolution and ecology of human and nonhuman primate sensory genes (opsin genes, olfactory receptor genes, taste receptor genes). My work particularly focuses on the role of diet/foraging strategy and habitat preference on intraspecific and interspecific variation.
2. *Effects of ecology on visual function*. My second major focus is identifying how ecological factors (habitat preference, diet, activity pattern) have shaped intraspecific and interspecific variation in mammalian visual function (e.g., color vision and visual acuity). I have developed methods of behaviorally evaluating visual function in primates, and have conducted comparative anatomical analyses of eye morphology and function.

PUBLICATIONS

Publications in Peer-Reviewed Journals

in revision Jacobs RL, **Veilleux CC**, Louis EE, Frankel DC, Irwin MT, Melin AD, Bradley BJ.
Less is more: Lemurs (*Eulemur* spp.) potentially benefit from loss of trichromatic vision. Submitted to *Behavioral Ecology and Sociobiology*.

- 2016 **Veilleux CC**, Scarry CJ, Di Fiore A, Kirk EC, Bolnick DA, Lewis RJ. Group benefit associated with polymorphic trichromacy in a Malagasy primate (*Propithecus verreauxi*). *Scientific Reports* 6: 38418
- 2016 Guevara EE, **Veilleux CC**, Saltonstall K, Caccone A, Mundy NI, Bradley BJ. Potential arms race in the coevolution of primates and angiosperms: brazzein sweet proteins and gorilla taste receptors. *American Journal of Physical Anthropology* 161: 181-185.
- 2014 **Veilleux CC**, Kirk EC. Visual acuity in mammals: effects of eye size and ecology. *Brain, Behavior and Evolution* 83: 43-53.
- 2014 **Veilleux CC**, Jacobs RL, Cummings ME, Louis EE, Bolnick DA. Opsin genes and visual ecology in a nocturnal folivorous lemur. *International Journal of Primatology* 35: 88-107.
- 2013 **Veilleux CC**, Louis EE, Bolnick DA. Nocturnal light environments influence color vision and signatures of selection on the *OPN1SW* opsin gene in nocturnal lemurs. *Molecular Biology and Evolution* 30: 1420-1437.
- 2012 **Veilleux CC**, Cummings ME. Nocturnal light environments and species ecology: implications for nocturnal color vision in forests. *Journal of Experimental Biology* 215: 4085-4096.
- 2011 **Veilleux CC**, Lewis RJ. Effects of habitat light intensity on mammalian eye shape. *Anatomical Record* 294: 905-914.
- 2009 **Veilleux CC**, Bolnick DA. Opsin gene polymorphism predicts trichromacy in a cathemeral lemur. *American Journal of Primatology* 71: 86-90.
- 2009 **Veilleux CC**, Kirk EC. Visual acuity in a cathemeral strepsirrhine (*Eulemur macaco flavifrons*). *American Journal of Primatology* 71: 342-352.

Chapters in Edited Volumes

- 2017 **Veilleux CC**. Genetics of primate color vision. In the *International Encyclopedia of Primatology*, Agustin Fuentes (ed). John Wiley and Sons, Inc.
- in press **Veilleux CC**. Primate color vision, genetics of. In *The International Encyclopedia of Biological Anthropology*, Wenda Trevathan (ed). John Wiley and Sons, Inc.
- in review **Veilleux CC**. Sensory polymorphisms and dietary adaptation. Invited for *Companion to Anthropological Genetics* (Wiley-Blackwell), editor Dennis O'Rourke.
- in revision Melin AD, **Veilleux CC**. Primate senses: finding and evaluating food. In *Primate Diet and Nutrition: Needing, Finding, and Using Food*, editors JE Lambert & J Rothman.

FUNDING AND AWARDS

Research Grants and Fellowships

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|---------|---|----------|
| 2015-16 | American Association of University Women
Postdoctoral Fellowship: <i>Sensory correlates of agricultural transitions: exploring the effect of subsistence strategies on the evolution of human taste and color vision</i> | \$30,000 |
| 2010 | University of Texas at Austin
Harrington Dissertation Fellowship | \$46,000 |
| 2009-10 | Wenner-Gren Anthropological Foundation
Dissertation Fieldwork Grant: <i>Effects of nocturnal light environment on the evolution of nocturnal primate color vision</i> | \$13,441 |

2009-10	Leakey Foundation Dissertation Grant: <i>Evolutionary effects of light environment on the evolution of nocturnal lemur color vision</i>	\$4,080
2009-10	American Philosophical Society Lewis and Clark Grant: <i>Effects of nocturnal light environment on the evolution of nocturnal primate color vision</i>	\$1,000
2008	American Society of Mammalogists Grant-in-Aid of Research: <i>Effects of nocturnal light environment on the evolution of nocturnal primate color vision</i>	\$1,500
2008-10	National Science Foundation Dissertation Improvement Grant (#0752692): <i>Ecological correlates of differential selection on S opsin genes in nocturnal primates</i>	\$13,133
2007	Sigma Xi Grant-in-Aid of Research	\$1,000
2006	University of Texas at Austin Liberal Arts Graduate Research Fellowship	\$2,000
2005-8	National Science Foundation Graduate Research Fellowship	\$120,000
2005-7	University of Texas at Austin David J. Bruton Fellowship	\$3,000
2004-5	University of Texas at Austin Pre-emptive Fellowship	\$15,000

Awards

2012	Outstanding Student Presentation in Anthropological Genetics, American Association of Physical Anthropologists meeting (\$200)
2012	Pollitzer Travel Award, American Assoc. Physical Anthropologists (\$500)
2011	Honorable Mention for Student Prize, American Society of Primatologists (\$100)
2010	Podium Prize, Texas Association of Biological Anthropologists meeting
2010	Mitchell Award for Excellence in Graduate Research, UT Austin (\$2000)
2010	Earnest Albert Hooton Prize, Am Assoc Physical Anthropologists meeting (\$750)
2008	Poster Prize, Texas Association of Biological Anthropologists meeting
2004	Dept. Award for Undergraduate Achievement in Anthropology, Arizona State University

TEACHING EXPERIENCE

2013, 2015-2017	Texas State University (lecturer)	San Marcos, TX
<u>Courses:</u> Biological Anthropology (ANTH 2414), Primate Behavior (ANTH 3342), History of Evolutionary Thought (ANTH 3307), Human Variation and Adaptation (ANTH 3343), graduate Primate Behavior (ANTH 5542), graduate Human Variation and Adaptation (ANTH 5543)		
2010, 2015	University of Texas at Austin (instructor)	Austin, TX
<u>Courses:</u> Introduction to Physical Anthropology (ANT 301, 2010), Human Anatomy (UT Austin Summer Pre-College Discovery Program, 2015)		
2007-2011	University of Texas at Austin (lab instructor/TA)	Austin, TX
<u>Courses:</u> Introduction to Physical Anthropology (ANT 301), Primate Anatomy (ANT 432L)		

MENTORING EXPERIENCE

Undergraduate Students (*continued to graduate or medical school, **earned PhD or MD)

Selby Olson 2017	Jenna Strawbridge 2009-10*
Chelsea Ogan 2016-17	Maggie Mitchell 2008-09
(Jacob) Raven Cortright 2016	Abbas Haidry 2008-09**
Kelly Chapman 2010-12*	Rachel Menegaz 2005-06**
Blake Kincaid 2009-10	Sara Zahendra 2005-06
Maeve Cavanaugh 2009-10	Katy Klymus 2005**

Graduate Students

2009-10 Solofo Andrianandrasanarivelo (Master's, University of Antananarivo, Madagascar)

SCHOLARLY PRESENTATIONS

Published Abstracts of Presentations at Professional Meetings

- accepted **Veilleux CC**, Hiramatsu C, Valenta K, Aureli F, Kawamura S, Melin AD. Interspecific and intraspecific variation in the use of touch during fruit foraging in primates. American Association of Physical Anthropologists.
- accepted Snodderly M, **Veilleux CC**, Kawamura S, E Fernandez-Duque, A Link, A Di Fiore. Genetic diversity of color vision in four sympatric New World primates (*Ateles*, *Lagothrix*, *Pithecia*, *Plecturocebus*) at the Tiputini Biodiversity Station in Amazonian Ecuador. American Association of Physical Anthropologists.
- 2017 **Veilleux CC**, Garrett EC, Bankoff RJ, Dominy NJ, Perry GH, Melin AD. Effects of agricultural transitions on the evolution of human sensory systems. *Am J Phys Anthropol* 162 (Suppl 64): 393.
- 2016 **Veilleux CC**, Garrett EC, Dominy N, Perry GH, Melin AD. The role of local adaptation in the evolution of human taste. International Primatological Society/American Society of Primatologists joint meeting. Chicago 2016.
- 2016 Garrett EC, **Veilleux CC**, Bankoff RJ, Orkin JD, Dominy NJ, Perry GH, Melin AD. Subsistence strategy and the evolution of human olfactory receptor genotypes. XXVI Congress of the International Primatological Society, Chicago 2016.
- 2016 Jacobs RL, **Veilleux CC**, Melin AD. Dichromacy as an adaptation for foraging in red-bellied lemurs (*Eulemur rubriventer*). *Am J Phys Anthropol* 159 (Suppl 62):183.
- 2013 **Veilleux CC**, Bolnick DA, Di Fiore A, Lewis RJ. Is there a role for color-sensitive foraging in folivorous sifaka (*Propithecus verreauxi*)? *Am J Phys Anthropol* 150 (Suppl 56):276.
- 2012 **Veilleux CC**, Louis EE, Bolnick DA. Genetic evidence of widespread differential selection for color vision in nocturnal lemurs. *Am J Phys Anthropol* 147 (Suppl 54):292.
- 2011 **Veilleux CC**. Effects of nocturnal light intensity on calling frequency in dry forest *Phaner* and *Lepilemur*. *Am J Primatol* 73 (Suppl 1): 43.
- 2011 **Veilleux CC**. Nocturnal light environments in Madagascar: implications for nocturnal primate color vision. *Am J Phys Anthropol* 144 (Suppl 52): 299.
- 2010 **Veilleux CC**, Louis EE, Bolnick DA. Variation in nocturnal lemur color vision: ecological correlates of differential selection. *Am J Primatol* 72 (Suppl 1): 63.
- 2010 **Veilleux CC**, Louis EE, Bolnick DA. Differential selection for color vision in two nocturnal folivores. *Am J Phys Anthropol* 141 (Suppl 50):233.

- 2009 **Veilleux CC**, Lewis RJ. Effects of habitat light intensity on the evolution of mammalian visual anatomy: implications for primate ecology and evolution. *Am J Phys Anthropol* 138 (Suppl 48):261.
- 2008 **Veilleux CC**. The influence of diet and activity pattern on visual acuity: implications for primate evolution. *Am J Phys Anthropol* 135 (Suppl. 46):213-214.
- 2007 **Veilleux CC**, Kirk EC. A behavioral test of visual acuity in the cathemeral strepsirrhine *Eulemur macaco flavifrons*. *Am J Phys Anthropol* 132 (Suppl. 44):237.
- 2006 **Veilleux CC**, Klymus K, Kirk EC. A behavioral method for measuring visual acuity in non-human primates. *Am J Primatol* 68 (Suppl. 1):76.

Scholarly Presentations without Published Abstracts

- 2010 “Nocturnal light environments and S-opsin gene evolution in nocturnal lemurs” poster at International Postgraduate Sensory Ecology Course, Lund University, Sweden
- 2009 “Habitat preference and nocturnal lemur color vision: implications for primate and human evolution” American Anthropological Association, Philadelphia PA

Invited Presentations

- 2017 “How agriculture shapes our senses.” Invited talk for University of Texas at Austin Biological Anthropology Seminar Series (BASIL). October 23.
- 2015 “Sensory adaptations in primate and human evolution: insights from molecular ecology.” Invited talk, Anthropology Department, University of Texas at San Antonio. December 2.
- 2015 “Ecological influences on visual acuity and color vision in non-human primates and humans.” Invited talk for Shoji Kawamura’s Laboratory of Evolutionary Anthropology, University of Tokyo. August 18.
- 2013 “Seeing the forest for the trees: ecology, vision, and primate evolution.” Invited talk, Anthropology Department, Stony Brook University. April 29.
- 2013 “Experiencing nocturnality: understanding the visual world of nocturnal lemurs.” Texas State University Anthropology Department Speaker Series. February 6.
- 2012 “Primate molecular ecology.” Guest lecture for Anthropological Genetics (ANT 349D), University of Texas at Austin. November 27.
- 2009 “Nocturnal light environments: implications for nocturnal lemur visual systems” invited talk for Stony Brook University Study Abroad Program, Centre ValBio, Ranomafana National Park, Madagascar.

CONFERENCE PANELS ORGANIZED

- 2011 “Ears, eyes and noses: revisiting the ecology and evolution of primate special senses.” Poster symposium co-organized with Eva Garrett and Rachel Jacobs. American Association of Physical Anthropologists Annual Meeting, Minneapolis, MN.

RESEARCH PROJECTS, EXPERIENCE, AND TRAINING

Molecular and Bioinformatics Projects

- 2016-present *Identifying opsin gene variation in four species of New World monkeys.* In collaboration with Tony Di Fiore (Primate Molecular Ecology and Evolution Lab, UT Austin) and Max Snodderly (UT Austin), and Shoji Kawamura (University of Tokyo)

- 2015-present *Bioinformatics and selection analyses of human sensory genes (taste, olfaction, opsin)*. In collaboration with Amanda Melin (PI, Primate Molecular Ecology Lab, University of Calgary), Eva Garrett (Boston University), PJ Perry (Penn State), Nate Dominy (Dartmouth College)
- 2013-present *RNA extraction, gene expression, bioinformatics, and evolution of lemur taste receptor genes*. In collaboration with Brenda Bradley (PI, Molecular Anthropology Lab, Yale University, now at George Washington University)
- 2007-16 *Population genetic, phylogenetic, and genotyping analyses of opsin genes in lemurs*. PI, in collaboration with Deborah Bolnick (Molecular Anthropology Lab, UT Austin), Edward Louis (Molecular Genetics Lab, Henry Doorly Zoo), Tony Di Fiore (Primate Molecular Ecology and Evolution Lab, UT Austin)

Field-based Projects

- 2017-present *Interspecific and intraspecific variation in the use of touch during foraging by primates*. In collaboration with Amanda Melin (University of Calgary), Shasta Webb (U of C grad student), Kim Valenta (McGill University).
- 2013-16 *Statistical analyses of sifaka feeding behavior, demography, and morphometric data*. In collaboration with Rebecca Lewis (UT Austin), Chris Kirk (UT Austin), Clara Scarry (Miami University), Deborah Bolnick (UT Austin), Tony Di Fiore (UT Austin).
- 2012-13 *Statistical analyses of spectral reflectance data from Avahi foods under different illuminants at Ranomafana National Park, Madagascar*. In collaboration with Rachel Jacobs (George Washington University), Molly Cummings (UT Austin), Deborah Bolnick (UT Austin), Edward Louis (Henry Doorly Zoo).
- 2009 *Field measurements of light environments and forest ecology*. Kirindy Mitea National Park and Ranomafana National Park, Madagascar. PI, dissertation, in collaboration with Molly Cummings (UT Austin).

Sensory Anatomy and Behavior Projects

- 2016-present *Optokinetic response and behavioral measurement of color discrimination in lemurs*. In collaboration with Addison Kemp (UT Austin PhD student), Raymond Vagell (Hunter College masters student), Andrea Baden (Hunter College), Rachel Jacobs (George Washington University)
- 2005-6 *Behavioral measurement of lemur visual acuity using a forced choice test*. UT Austin Animal Resource Center, in collaboration with Chris Kirk (UT Austin)
- 2005 *Effects of hormonal manipulation on the attractiveness of male túngara frog (Physalaemus pustulosus) mating calls*. In collaboration with Elizabeth Dawson and Mike Ryan (UT Austin)

Other Research Experience and Training

- 2015 Genome Variant Analysis Course, University of Texas at Austin, Austin, TX
- 2015 RNA-Seq 1 and RNA-Seq Hands-On Analysis courses, UT Austin, Austin, TX
- 2013 Duke Bioinformatics Workshop, Durham, NC
- 2012,13 Genomics Workshop, Am. Assoc. Anthropological Genetics, San Antonio, TX
- 2010 International Postgraduate Sensory Ecology Course, Lund University, Sweden
- 2005-6 Paleontological field assistant, Dalquest Research Site, Texas with Chris Kirk
- 2003 Internship at Primate Foundation of Arizona - Behavioral study of social contagion in captive chimpanzees

MEDIA COVERAGE OF RESEARCH

1. "Female Lemurs with Color Vision Provide Advantages for Their Group" Dec. 5, 2016
Phys.org: <http://phys.org/news/2016-12-female-lemurs-vision-advantages-group.html>
Science Daily: <https://www.sciencedaily.com/releases/2016/12/161205165837.htm>
2. "What if Only Females Could See Color?" *Nautilus*, Pierre Bienaimé Feb 19, 2017
<http://nautil.us/blog/what-if-only-females-could-see-color>

SERVICE

Professional Service

- 2017-18 Publications Committee, American Society of Primatologists
- 2011-17 Manuscript Reviewer, *American Journal of Physical Anthropology* (1), *American Journal of Primatology* (2), *Animal Behavior and Cognition* (2), *International Journal of Primatology* (2), *Biological Journal of the Linnaean Society* (1), *Genome Biology and Evolution* (1), *Journal of Comparative Psychology* (1), *Molecular Ecology* (2), *Molecular Biology and Evolution* (2), *Philosophical Transactions B* (1), *PLOS One* (1)
- 2015-17 Grant Reviewer, the Leakey Foundation, National Geographic Society

University Service

- 2008-9 Chair, Liberal Arts Graduate Research Fellowship Committee, UT-Austin:
Implemented new online application system, evaluated grant proposals from graduate students, awarded \$40,000 grant funds
- 2007-8 Co-chair, Liberal Arts Graduate Research Fellowship Committee, UT-Austin:
Developed new advertising campaign, evaluated grant proposals from graduate students, awarded \$50,000 grant funds

Departmental Service

- 2009 Student Representative, Physical Anthropology Hiring Committee
- 2008-9 Planning Committee, New Directions in Anthropology Graduate Student Research Conference, Anthropology Graduate Student Association
- 2008 Coordinator, Informal Physical Anthropology Seminar Series, UT-Austin.

COMMUNITY OUTREACH

- 2017 Invited presentation on lemur diversity, behavior, and ecology for kindergarteners at Austin Discovery School, Austin, TX
- 2010-13 Organizer, "Leaping Lemurs" activity at ExploreUT, a university "open house" for the public, designed to engage children of all ages in science and primatology
- 2011 Organizer, "Primate and Mammal Color Vision" activity for K-12 teachers through UT Austin's Hot Science Cool Talks Outreach Series. Designed to help K-12 teachers develop lesson plans on trichromatic color vision in primates.
- 2006-9 Workshop Leader, Girlstart's Expanding Your Horizons Conference, a one-day conference for elementary and middle school girls to encourage interest in science and technology careers.

PROFESSIONAL SOCIETIES

American Association of Physical Anthropologists, American Association of Anthropological Genetics, American Society of Primatologists, Canadian Association of Physical Anthropologists, International Primatological Society, Phi Beta Kappa (elected 2004), Sigma Xi (elected 2007), Texas Association of Biological Anthropologists