

CARRIE C. VEILLEUX – CURRICULUM VITAE

Department of Anatomy
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AREAS OF SPECIALIZATION

sensory ecology, primate evolutionary genetics, primate evolution

APPOINTMENTS

2020-present Assistant Professor
2018-2020 Postdoctoral Research Associate, University of Texas at Austin
2018-2019 Lecturer, Anthropology, University of Texas at Austin
2018-18 Postdoctoral Researcher, University of North Texas Health Science Center
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 environments 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 genetic and phylogenetic approaches to explore the evolution and ecology of human, nonhuman primate, and mammal sensory genes (opsin genes, olfactory receptor genes, taste receptor genes, mechanoreceptor 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 primate and mammal 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 mammalian eye morphology and function.

PUBLICATIONS

Publications in Peer-Reviewed Journals

- 2019 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. *Behavioral Ecology and Sociobiology* 77:22.
- 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

- in press 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.
- 2020 **Veilleux CC**. Seeing in the dark: Visual function and ecology in lorises and pottos. Invited chapter for *Behaviour, Ecology and Evolutionary Biology of Lorises and Pottos* (Cambridge University Press), editors KAI Nekaris & AM Burrows.
- 2019 **Veilleux CC**. Sensory polymorphisms and dietary adaptation. In *Companion to Anthropological Genetics* (Wiley-Blackwell), editor Dennis O'Rourke. pp. 233-250.
- 2018 **Veilleux CC**. Primate color vision, genetics of. In *The International Encyclopedia of Biological Anthropology*, Wenda Trevathan (ed). John Wiley and Sons, Inc.

2017 **Veilleux CC.** Genetics of primate color vision. In the *International Encyclopedia of Primatology*, Agustin Fuentes (ed). John Wiley and Sons, Inc.

FUNDING AND AWARDS

Research Grants and Fellowships

2018	University of Calgary <i>Fingers & food: The sensory and molecular ecology of primate discriminative touch</i>	\$5000 (CAD)
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 Department Award for Undergraduate Achievement in Anthropology, Arizona State University

TEACHING EXPERIENCE

- 2020 Midwestern University Glendale, AZ
Courses: Gross Anatomy/Embryology (ANATG 1551/1552/1553, summer 2020)
- 2018 University of Texas at Austin (lecturer) Austin, TX
Courses: Comparative Primate Ecology (ANT 346M, Fall 2018), Sex and Human Nature (ANT 348K/BIO337/WGS323, Spring 2019)
- 2015-17 Texas State University (lecturer) San Marcos, TX
Courses: 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)
- 2015 University of Texas at Austin (instructor) Austin, TX
Courses: Human Anatomy (UT Austin Summer Pre-College Discovery Program)
- 2013 Texas State University (lecturer) San Marcos, TX
Courses: Primate Behavior (ANTH 3342)
- 2010 University of Texas at Austin (instructor) Austin, TX
Courses: Introduction to Physical Anthropology (ANT 301)
- 2007-11 University of Texas at Austin (lab instructor/teaching assistant) Austin, TX
Courses: Intro to Physical Anthropology (ANT 301), Primate Anatomy (ANT 432L)

MENTORING EXPERIENCE

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

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|------------------------------|----------------------------|
| 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

- 2019 **Veilleux CC**, Hiramatsu C, Webb S, Auerli F, Schaffner CM, Kawamura S, Melin AD. I see, you smell: interspecific variation in sensory use for fruit evaluation among sympatric New World monkeys. American Association of Physical Anthropologists, March 2019.
- 2018 **Veilleux CC**, Hiramatsu C, Webb S, Auerli F, Kawamura S, Melin AD. Interspecific differences in sensory foraging behavior among sympatric platyrrhines. American Society of Primatologists, August 2018.
- 2018 **Veilleux CC**, Hiramatsu C, Valenta K, Webb S, Aureli F, Kawamura S, Melin AD. Interspecific and intraspecific variation in the use of touch during fruit foraging in primates. *Am J Phys Anthropol* 165 (S 66): 285-6.
- 2018 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 Tiptuni Biodiversity Station in Amazonian Ecuador. *Am J Phys Anthropol* 165 (S 66): 258.
- 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 (Supp 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

- 2017 “Farming and the convergent evolution of human chemosensation” podium presentation, Canadian Association of Physical Anthropologists, Edmonton, Alberta
- 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

- 2018 “Primate Anatomy and Adaptations II: Primate Vision.” Guest lecture for graduate Physical Anthropology Core: Morphology/Evolution, University of Texas at Austin. October 18.
- 2018 “Human Variation and Evolution.” Guest lecture for Anthropological Genetics, University of Calgary. March 19.
- 2017 “How agriculture shapes our senses.” Invited talk for University of Texas at Austin Biological Anthropology Seminar Series. 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

- 2018-present *Understanding dietary and sensory adaptation through comparative genomics of Costa Rican mammals.* With Amanda Melin (University of Calgary), Mareike Janiak (U Calgary), Magdalena Muchlinski (UNT Health Science Center).
- 2016-present *Identifying opsin gene variation in four species of New World monkeys.* In collaboration with Tony Di Fiore (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).* With Amanda Melin (PI, U 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.* With Brenda Bradley (PI, 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 (UT Austin), Edward Louis (Henry Doorly Zoo), Tony Di Fiore (UT Austin)

Field-based Projects

- 2017-present *Interspecific and intraspecific variation in the use of the senses during foraging by primates.* With Amanda Melin (University of Calgary), Shasta Webb (U of C grad student), Kim Valenta (McGill University), Chihiro Hiramatsu (Kyushu University), Filippo Aureli (Universidad Veracruzana), Shoji Kawamura (University of Tokyo)
- 2013-16 *Statistical analyses of sifaka feeding behavior, demography, and morphometric data.* With UT Austin researchers Rebecca Lewis, Chris Kirk, Deborah Bolnick, Tony Di Fiore, and Clara Scarry (Sacramento State)
- 2012-13 *Statistical analyses of spectral reflectance data from Avahi foods under different illuminants at Ranomafana National Park, Madagascar.* 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, with Molly Cummings (UT Austin)

Sensory Anatomy and Behavior Projects

- 2016-present *Optokinetic response and behavioral measurement of visual function in lemurs.* With Addison Kemp (UT Austin PhD graduate)
- 2005-6 *Behavioral measurement of lemur visual acuity using a forced choice test.* With Chris Kirk (UT Austin)
- 2005 *Effects of hormonal manipulation on the attractiveness of male túngara frog (Physalaemus pustulosus) mating calls.* With Beth Dawson and Mike Ryan (UT Austin)

Other Research Experience and Training

- 2018 Winter School B@G 2018: Bioinformatics for Adaptation Genomics, Weggis, Switzerland
- 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 Behavioral Observation Internship at Primate Foundation of Arizona

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

- 2016-18 Publications Committee, American Society of Primatologists
- 2011-18 Manuscript Reviewer, *American Journal of Physical Anthropology* (1), *American Journal of Primatology* (2), *American Naturalist* (1), *Animal Behavior and Cognition* (2), *International Journal of Primatology* (2), *Biological Journal of the Linnean 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), *Proceedings of the Royal Society B* (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