

# Dena J. Clink, Ph.D.

*Southeast Asia Team Lead*

*K. Lisa Yang Center for Conservation Bioacoustics*

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## EDUCATION

2017, University of California, Davis, Evolutionary Anthropology, Ph.D.

*Dissertation: The Evolutionary and Ecological Implications of Variation in Bornean Gibbon (*Hylobates muelleri*) Female Calls*

2009, Portland State University, Biology, M.S.

*Thesis: The Effects of Experimental Phosphorus Enrichment on Florida Everglades Periphyton Pigment Signatures Analyzed Using High-performance Liquid Chromatography (HPLC)*

2006, University of Puget Sound, Biology, B.S.

## TECHNICAL SKILLS

Machine learning; Detection & classification; Digital signal processing; Bayesian statistical design & analysis; Big data organization & analysis; Data visualization; Management of project teams; Presentations to stakeholders, board members, and funding committees

## PROFESSIONAL AND TEACHING POSITIONS

2021- present, *Research Associate: Southeast Asia Team Lead*, K. Lisa Yang Center for Conservation Bioacoustics

2021, *Associate Instructor*, Cornell University, Ithaca, NY, USA, Course: Neurobiology and Behavior I: Introduction to Behavior

2020- present, *Sound Analysis Workshop Instructor*, K. Lisa Yang Center for Conservation Bioacoustics, Cornell Lab of Ornithology, Cornell University, Ithaca, NY, USA. Course: Sound Analysis Workshop

2020, *Associate Instructor*, Cornell University, Ithaca, NY, USA, Course: Neurobiology and Behavior I: Introduction to Behavior

2018- 2021, *Postdoctoral Scientist*, K. Lisa Yang Center for Conservation Bioacoustics

2018, *ASEAN Fulbright U.S. Scholar*, Universiti of Malaysia, Sabah, & Universitas Sam Ratulangi, Indonesia, *Project title: A comparative, inter-disciplinary approach to understanding the evolution of monogamy and duetting behavior in non-human primates.*

2017, *Associate Instructor*, University of California, Davis, CA, USA, *Courses: Primate Evolutionary Ecology; Human Evolution*

2017, *Associate Instructor*, University of California, Davis, CA, USA, *Course: Introduction to Primatology*

2016, *Associate Instructor*, University of California, Davis, CA, USA, *Course: Primate Evolutionary Ecology*

2014-2015, *Fulbright Researcher*. Universiti of Malaysia, Sabah *Project title: Understanding the drivers of variation in territorial calls of Bornean gibbons.*

2014-2015, *Research Fellow*, Institute for Tropical Biology and Conservation, University of Malaysia, Sabah, Malaysia

2011-2017, *Teaching Assistant*, University of California, Davis, CA, USA, *Courses*: Primate Socioecology, Human Evolutionary Biology, Behavioral and Evolutionary Biology of the Human Life Cycle

## PUBLICATIONS (\* indicates student advisee)

Kennedy, A. \*, Ahmad, A.H., Johnson, L.M., H. Klinck & **D.J. Clink**. (accepted). Lack of evidence for acoustic niche partitioning in two sympatric Bornean hornbill species. *Biotropica*.

Comella, I.A. \*, Tasirin, J.S., Klinck, H., Johnson, L.M. & **D.J. Clink**. (2022). Investigating note repertoires and acoustic tradeoffs in the duet contributions of a basal Haplorrhine primate. *Frontiers in Ecology and Evolution*. 10: 910121.

Lau, A.R. \*, Zafar, M. \*, Ahmad, A.H. & **D.J. Clink**. (2022). Investigating temporal coordination in the duet contributions of a pair-living small ape. *Behavioral Ecology and Sociobiology*. 76: 91.

**Clink, D. J.**, Lau, A.R. \*, Kanthaswamy, S., Johnson, L.M. & K.L. Bales. (2021). Limited evidence for kin signatures in the duet contributions of a South American primate. *Journal of Evolutionary Biology*. 35: 51-63.

**Clink, D. J.**, Zafar, M. \*, Ahmad, A.H. & Lau, A.R. \* (2021). Limited evidence for individual signatures or site-level patterns of variation in male Northern gray gibbon (*Hylobates funereus*) duet codas. *International Journal of Primatology*. 42: 896-914.

**Clink, D. J.**, Groves, T. \*, Ahmad, A.H. & H. Klinck. (2021). Not by the light of the moon: investigating circadian rhythms and ecological predictors of calling in Bornean great argus. *PLOS ONE*. 16: e0246564.

**Clink, D. J.** & H. Klinck. (2021). Unsupervised acoustic classification of individual gibbon females and the implications for passive acoustic monitoring. *Methods in Ecology and Evolution*. 12: 328-341.

**Clink, D. J.** & A.R. Lau \*. (2020). Adherence to Menzerath's Law is the exception (not the rule) in three duetting primate species. *Royal Society of Open Science*. 7: 201557.

Sethi, S.S, Jones, N.S., Fulcher, B.D., Picinali, L., Bernard, H., **Clink, D. J.**, Klinck, H., Orme, C.D.L., Wrege, P., & R. Ewers. (2020). Characterizing soundscapes across diverse ecosystems using a universal acoustic feature set. *Proceedings of the National Academy of Sciences of the United States of America*. 117: 17049-17055.

Lau, A.R. \*, **Clink, D. J.** & K. L. Bales. (2020). Individuality in the vocalizations of adult and infant coppery titi monkeys (*Plecturocebus cupreus*). *American Journal of Primatology*. e23134.

**Clink, D. J.**, Ahmad, A.H. & H. Klinck. (2020). Brevity is not a universal in animal communication: evidence for compression depends on the unit of analysis in small ape vocalizations. *Royal Society of Open Science*. 7: 200151.

**Clink, D. J.**, Ahmad, A.H. & H. Klinck. (2020). Gibbons aren't singing in the rain: presence and amount of rainfall influences ape calling behavior in Sabah, Malaysia. *Scientific Reports*. 10: 1-13.

**Clink, D. J.**, Lau, A.R. \* & K. L. Bales. (2019). Pulse rate and duration of pulse elements in titi monkey duets reflect caller age and pair-bond length. *Behaviour*. 1: 1-24.

**Clink, D. J.**, Tasirin, J.S. & H. Klinck. (2019). Vocal individuality and rhythm in male and female duet contributions of a nonhuman primate. *Current Zoology*. 0: 1-14.

Lau, A.R. \*, **Clink, D.J.**, Crofoot, M. C., & A.J. Marshall. (2018). Evidence for high variability in temporal features of male Bornean gibbon (*Hylobates muelleri*) codas. *International Journal of Primatology*. 39: 670-684.

**Clink, D. J.**, Grote, M.N., Crofoot, M. C., & A.J. Marshall. (2018). Understanding sources of variance and correlation among features of Bornean gibbon (*Hylobates muelleri*) female calls. *Journal of the Acoustical Society of America*. 142: 1-11

**Clink, D. J.**, Charif, R.A., Crofoot, M. C., & A.J. Marshall. (2018). Evidence for vocal performance constraints in a female non-human primate. *Animal Behaviour*. 141: 85-94.

**Clink, D. J.**, Crofoot, M. C., & A.J. Marshall. (2018). Application of a semi-automated vocal fingerprinting approach to monitor Bornean gibbon females in an experimentally fragmented landscape in Sabah, Malaysia. *Bioacoustics*. 1-17.

**Clink, D. J.**, Bernard, H., Crofoot, M. C., & A.J. Marshall. (2017). Investigating individual vocal signatures and small-scale patterns of geographic variation in female Bornean gibbon (*Hylobates muelleri*) great calls. *International Journal of Primatology*. 38: 656-671.

**Clink, D. J.**, Dillis, C., Feilen, K. L., Beaudrot, L., & A.J. Marshall. (2017). Dietary diversity, feeding selectivity, and responses to fruit scarcity of two sympatric Bornean primates (*Hylobates albibarbis* and *Presbytis rubicunda rubida*). *PLOS ONE*. 12: e0173369.

Dillis, C., Beaudrot, L., Feilen, K.L., **Clink, D. J.**, Wittmer, H.U. & A.J. Marshall. (2015). Modeling the ecological and phenological predictors of fruit consumption by gibbons (*Hylobates albibarbis*). *Biotropica*. 47: 85-93.

## BOOK CHAPTERS AND OTHER ARTICLES

Pavan, G., Budney, G., Klinck, H., Glotin, H., **Clink, D. J.** and J.A. Thomas. (2022): The history of sound recording, sensing, and analysis equipment. In: Jeanette Thomas, J. A., and Simmons, A. M. (eds.): *Exploring Animal Behavior through Sound: Applications of Bioacoustical Studies*.

**Clink, D. J.** (2021). What studying the songs of a distant primate relative can teach us about ourselves. *Frontiers for Young Minds*. 9:575984.

Caro, T., Charles, G.K., **Clink, D. J.**, Riggio, J., Weill, A.M. & C. Whitesell. (2016). Protected areas under threat. In: Sample, V.A., Bixler, R.P., Miller, C. (Eds.), *Forest Conservation in the Anthropocene: Science, Policy, and Practice*. The University Press of Colorado, Boulder, CO, pp. 83-98. <https://doi.org/10.5876/9781607324591.c006>.

## PRE-PRINTS OR IN REVIEW (\* indicates student advisee)

**Clink, D. J.**, Comella, I.A.\*, Tasirin, J.S. & H. Klinck. (in review). A workflow for the automated detection and classification of female gibbon calls from long-term acoustic recordings.

D'Agostino, J. \*, Spehar, S., Abdullah, A. & **D.J. Clink**. (in review). Variation in wild siamang (*Symphalangus syndactylus*) US-II phrases: further evidence of flexibility in a previously described stereotyped vocalization.

Vu, T.T., Chi, N.T., Doherty, P., Nguyen, H.T., **Clink, D. J.**, Dac, M.N., Thanh, H.D. & T.G. Trong. (in review). Using smartphones and bioacoustics to monitor endangered bird species.

**Clink, D. J.** & H. Klinck. (2019). gibbonR: An R package for the detection and classification of acoustic signals using machine learning. *arXiv*, 1906.02572.

## CONFERENCE PRESENTATIONS (\* indicates student advisee)

**Clink, D. J.**, Pelkie, C.R., Charif, R.A & H. Klinck. Passive acoustic monitoring of primates and their habitats: best practices and guidelines. Presented at: International Primatological Society Conference, January 2022, Quito, Ecuador.

- Kennedy, A. \*, Awad, R. \*, Lakdari, W.\*, Ahmad, A.H., Klinck, H. & **D.J. Clink**. Distinguishing helmeted hornbill vocalizations using unsupervised clustering techniques. Presented at: The Animal Behavior Live Virtual Conference, November 2021, USA.
- Lau, A. R. \*, **Clink, D. J.**, & Bales, K. L. (2021). Insight into the proximate mechanisms leading to variation in titi monkey (*Plecturocebus cupreus*) vocal duets. Presented at: American Society of Primatologists Conference, November 2021, USA.
- Ross, W. \*, Kaz, H.\*, Madhusudhana, M., **Clink, D. J.** & W.M. Erb. An evaluation of vocal complexity in the long calls of Bornean orangutans. Presented at: The Animal Behavior Society Virtual Conference, August 2021, USA.
- Bohn, G. \*, Ahmad, A.H., H. Klinck & **D.J. Clink**. Environmental effects on transmission of individual signatures in Northern gray gibbon calls. Presented at: The Animal Behavior Society Virtual Conference, August 2021, USA.
- Comella, I.A. \*, Tasirin, J.S., H. Klinck & **D.J. Clink**. Applying human linguistic laws to Gursky's spectral tarsier (*Tarsius spectrumgurskyae*). Presented at: The Animal Behavior Society Virtual Conference, August 2021, USA.
- Lau, A. R. \*, **Clink, D. J.**, & Bales, K. L. (2021). Proximate mechanisms for variation in titi monkey (*Plecturocebus cupreus*) vocal duets. Presented at: Society for Behavioral Neuroendocrinology Virtual Conference, July 2021, USA.
- Clink, D. J.** & Kennedy, A. \*. Acoustic niche partitioning of two sympatric Bornean hornbill species. Presented at: The Animal Behavior Society Twitter Conference, January 2021, USA.
- Clink, D. J.** Unsupervised acoustic classification of individual gibbon females. Presented at: BES Tropical & Conservation Ecology Twitter Conference: Advances in Technology and Innovative Methods, November 2020, UK.
- Bhalla, A.S. \*, Bohn, G. \*, Kennedy, A. \*, Ahmad, A.H., Klinck, H. & **D.J. Clink**. Use of bioacoustics techniques to study vocal behavior of threatened Southeast Asian vertebrates. Presented at: The Animal Behavior Society Virtual Conference, July 2020, USA.
- Lau, A.R. \*, **Clink, D. J.**, & K.L. Bales. (2019). Individuality in the vocalizations of adult and infant coppery titi monkeys (*Plecturocebus cupreus*). Presented at: The Acoustical Society of America Conference, December 2019, San Diego, CA.
- Clink, D.J.** & H. Klinck. A case study on Bornean gibbons highlights the challenges for incorporating individual identity into passive acoustic monitoring surveys. Presented at: The Acoustical Society of America Conference, December 2019, San Diego, CA.
- Lau, A.R. \*, **Clink, D. J.**, & K.L. Bales. (2019). Vocal individuality in two note types of the duet vocalizations of coppery titi monkeys (*Plecturocebus cupreus*). Presented at: The American Society of Primatologists Meeting, August 2019, Madison, WI.
- Clink, D. J.**, Grote, M.N., Crofoot, M.C. & A.J. Marshall. A multivariate approach to investigating within-individual, between-individual and between-site variation in Bornean gibbon female great calls. Presented at: 4th International Symposium on Acoustic Communication by Animals, July 2017, Omaha, NE.
- Clink, D. J.**, Crofoot, M.C., Bernard H. & A.J. Marshall. Utilizing vocal fingerprints to monitor Bornean gray gibbons (*Hylobates funereus*) at the Stability of Altered Forest Ecosystems project in Sabah, Malaysia. Presented at: Joint meeting of International Primatological Society and American Society of Primatologists, August 2016, Chicago, IL.
- Juarez, C.P., **Clink, D.J.** & E. Fernandez-Duque. Demographic characterization of owl monkeys (*Aotus azari azari*) in gallery forests and forest islands of the Argentinean Chaco. Presented at: The American Society of Primatologists Meeting, September 2012, Sacramento, CA.

## INVITED PRESENTATIONS

**Clink, D. J.** Variasi Individual Suara Owa Borneo dan Konservasinya. Presented at: ‘Festival Owa: Konservasi dan Seni’ organized by Perhimpunan Ahli dan Pemerhati Primata Indonesia (Indonesian Primatologist Association), October 2021, Indonesia.

**Clink, D. J.** Machine learning approaches provide insights into behavior, ecology and conservation of nonhuman primates. Presented at: Universiti Teknologi MARA Seminar Series, August 2021, Malaysia.

**Clink, D. J.** Machine learning approaches provide insights into behavior, ecology and conservation of nonhuman primates. Presented at: Syracuse University Biology Seminar Series, April 2021, USA.

**Clink, D. J.** & H. Klinck. Acoustic monitoring of vocal Southeast Asian primates and their habitats: recent advances and challenges. Presented at: International Symposium on Tropical Forestry and Environmental Sciences Conference, September 2019, East Kalimantan, Indonesia.

**Clink, D. J.** Primate evolution, ecology and conservation through the lens of bioacoustics. Presented at: Sound Analysis Workshop, May 2019, Cornell University, Ithaca, NY.

**Clink, D. J.** Eavesdropping on Southeast Asian primates– What bioacoustics can teach us about primate evolution, ecology and conservation. Presented at: Anthropology Department Seminar, January 2019, University of Florida, Gainesville, FL.

**Clink, D. J.** Acoustic monitoring of vocal Southeast Asian primates and their habitats: recent advances and challenges. Presented at: Southeast Asian Biodiversity, Science Education and Humanity International Conference, May 2018, Banda Aceh, Indonesia.

## GRANTS AND FELLOWSHIPS

2021 - Anonymous donor - \$300,000

2021 - World Hope International - \$100,000

2019 - TNC-Cornell Collaborative Research Grant- \$61,463

2018 - Fulbright ASEAN U.S. Scholar Award- \$37,000

2016 - Mentoring at Critical Transitions (MCT) Wakeham Fellowship, UC Davis- \$2500

2016 - Crook Travel Award for participation in the International Primatological Society/American Society of Primatologists Meeting- \$300

2016 - SeaBASS Travel Award- \$500

2014 - Fulbright Student Researcher Scholarship - \$15,000

2014 - American Society of Primatologists Conservation Grant - \$1000

2013 - UCD Summer Research Fellowship - \$3000

2013 - Cleveland Metroparks Zoo Grant - \$3100

2012 - UCD Summer Research Fellowship - \$4000

2012 - Primate Conservation Inc. Research Grant - \$3100

## WORKSHOPS

July 2022 (ongoing) - Organizer and contributor to Bioacoustics Equipment & Mentorship Award for Indonesian and Malaysian scientists. Link to call for proposals: <https://www.birds.cornell.edu/ccb/call-for-proposals-bioacoustics-equipment-mentorship-award/>

November 2021- Contributor to the ‘Introductory seminar series on computer programs used in bioacoustics’ organized by the University of Zürich. Talk titled: ‘Using Raven for bioacoustic analysis’.

April 2021 - Organizer and contributor for the ‘Virtual Sound Analysis Workshop’ for participants in the Caribbean. Done in collaboration with the Anguilla National Trust.

January 2021 - Organizer and contributor for the ‘Virtual Sound Analysis Workshop’ for participants in Malaysia and Southeast Asia. Done in collaboration with the Malaysian Primatological Society.

September 2019 - Organizer and contributor for Conservation bioacoustics workshop at the Student Conference for Conservation Science, American Museum of Natural History, NY, USA.

## **PUBLIC OUTREACH**

2022- Contributor to ‘Bioacoustics in Indonesia and Malaysia: Conservation in Action’. Link: <https://m.youtube.com/watch?v=3QXYF0m5Ksk&feature=youtu.be>

2021 - Contributor to ‘Exploring Nature Through Sound and Music: Tropical Oceans and Islands’. Link: <https://academy.allaboutbirds.org/live-event/explore-nature-through-sound-and-music-tropical-islands-and-ocean/>

2020 - Animal Behavior Society Twitter Takeover.  
Link: <https://twitter.com/AnimBehSociety/status/1308043636496576514?s=20>

2020- Contributor to Center for Conservation Bioacoustics Blog titled: “CCB in Southeast Asia: Gibbons, bioacoustics, and durian, oh my!”  
Link: <https://www.birds.cornell.edu/ccb/ccb-in-southeast-asia-gibbons-bioacoustics-and-durian/>.

2019 - Contributor to the Mongabay podcast titled: “How listening to individual gibbons can benefit conservation.”  
Link: <https://news.mongabay.com/2019/11/audio-how-listening-to-individual-gibbons-can-benefit-conservation/>

## **JOURNALS REFEREED**

American Journal of Physical Anthropology; Folia Primatologica; Asian Primates; Scientific Reports; American Journal of Primatology; Acta Ethologica; Journal of the Acoustical Society of America

## **ACADEMIC SERVICE**

Fall 2022- Member of the Rose Postdoctoral Fellowship selection committee at the Cornell Lab of Ornithology  
Fall 2022 (ongoing) - Member of undergraduate affairs committee at the Cornell Lab of Ornithology  
Summer 2022 - Mentor for the Copula Program  
Winter 2022- Search committee for sound analysis workshop instructors  
Fall 2022 (ongoing) - Undergraduate research coordinator for the K. Lisa Yang Center for Conservation Bioacoustics  
Fall 2021- Search committee for Raven programmer position  
Summer 2021- Mentor for the Copula Program

## **DISSERTATION COMMITTEE MEMBER**

Justin D’Agostino, Southern Illinois University Carbondale, Defense date: May 2021  
Silvy M Van Kuijk, University of Texas, Austin, Defense date: TBD