

HERMAN PONTZER

Department of Anthropology
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Education

- 2006 Harvard University PhD Biological Anthropology
2003 Harvard University AM Biological Anthropology
1999 Penn State University BA Anthropology *with Highest Honors*

Current Appointment

Assistant Professor of Anthropology, Washington University
Director, Human Evolutionary Biomechanics Laboratory
Faculty Member, Evolution Ecology and Population Biology Program

Professional Affiliations

American Association of Physical Anthropologists
Society for Integrative and Comparative Biology

Grants

- 2009 – 10 Metabolic Cost of Living in Bonobos.
Wenner-Gren Foundation. \$23,500. Role: PI
- 2009 – 11 The Metabolic Cost of Living in Human Foragers.
National Science Foundation. \$196,760. NSF# 0850815. Role: PI
- 2008 Energy Use in Bonobos.
Washington University Faculty Research Grant. \$7,000. Role: PI
- 2005 – 07 Energetics and Evolution of Bipedalism: Chimpanzee Biomechanics.
L.S.B.Leakey Foundation Research Grant. \$19,740
Role: Co-PI with David A. Raichlen and Daniel E. Lieberman
- 2004 – 05 The Effect of Hindlimb Length on Running and Walking Performance
NSF Doctoral Dissertation Improvement Grant. \$9,800
Advisor: Daniel E. Lieberman NSF# 0433795

Awards and Fellowships

- 2008 –11 Earle H. & Suzanne S. Harbison Faculty Fellowship, Washington Univ.
- 2006 Richard J. Herrnstein Prize, Harvard Univ. Graduate School of Arts & Sciences
for “the best dissertation that exhibits excellent scholarship, originality and
breadth of thought, and a commitment to intellectual independence”

- 2006 Aleš Hrdlička Prize for Outstanding Student Paper, American Association of Physical Anthropologists.
- 2006 D. Dwight Davis Prize for Outstanding Student Paper, Society for Integrated and Comparative Biology.
- 2004 – 06 NSF-IGERT Fellowship. Harvard Biomechanics NSF-IGERT Program.
- 2002 – 05 Excellence in Teaching Award, Harvard University.
- 2000 – 03 NSF Graduate Fellowship. Biological Anthropology, Harvard University.
- 1999 Phi Beta Kappa

Publications

- Pontzer, H.**, Allen, V., Hutchinson, J.R. (*in press*) Biomechanics of running indicates endothermy in bipedal dinosaurs. *PLoS ONE*.
- Pontzer, H.**, Raichlen, D.A., Sockol, M.D. (*in press*) From treadmill to tropics: calculating ranging cost in chimpanzees. In: D’Aout, K. and Vereecke, E.E. (eds) *Studying Primate Locomotion: Linking Laboratory and Field Research*. New York, Springer.
- Pontzer, H.**, Kamilar, J.M. (2009) Great ranging associated with greater reproductive investment in mammals. *Proceedings of the National Academy of Sciences, USA*. 106, 192-196.
- Raichlen, D.A., Shapiro, L.J., **Pontzer, H.**, Sockol, M.D. (2009) Understanding increased hind limb weight support in chimpanzees and the evolution of primate kinetics. *American Journal of Physical Anthropology*. 138, 395 – 402.
- Pontzer, H.**, Holloway, J., Raichlen, D.A., Lieberman, D.E. (2009) Control and function of arm swing in human walking and running. *Journal of Experimental Biology*. 212, 523-534
- Pontzer, H.**, Raichlen, D.A., Sockol, M.D. (2009) The metabolic cost of walking in humans, chimpanzees, and early hominins. *Journal of Human Evolution*. 56, 43-54.
- Raichlen, D.A., **Pontzer, H.**, Sockol, M.D. (2008) The Laetoli footprints and early hominin kinematics. *Journal of Human Evolution*. 54, 112-117.
- Carter, M.L., **Pontzer, H.**, Wrangham, R.W., Kerbis Peterhans, J. (2008) Skeletal pathology in *Pan troglodytes schweinfurthii* in Kibale National Park, Uganda. *American Journal of Physical Anthropology*. 135, 389-403.
- Sockol, M.D., Raichlen, D.A., **Pontzer, H.** (2007) Chimpanzee locomotor energetics and the origin of human bipedalism. *Proceedings of the National Academy of Sciences, USA*. 30, 12265-12269.
- Lordkipanidze, D., Jashashvili, T., Vekua, V., Ponce de Leon, M.S., Zollikofer, C.P.E., Rightmire, G.P., **Pontzer, H.**, Ferring, R., Oms, O., Tappen, M., *et al.* (2007) Postcranial evidence from early *Homo* from Dmanisi, Georgia. *Nature*. 449, 305-310.
- Pontzer, H.** (2007) Limb length and the scaling of locomotor cost in terrestrial animals. *Journal of Experimental Biology*. 210, 1752-1761.

- Pontzer, H.** (2007) Predicting locomotor cost in terrestrial animals: a test of the LiMb model in humans and quadrupeds. *Journal of Experimental Biology*. 210, 484 – 494.
- Lieberman, D.E., Raichlen, D.A., **Pontzer, H.**, Bramble, D.M., Cutright-Smith, E. (2006) The human gluteus maximus and its role in running. *Journal of Experimental Biology*. 209, 2143 – 2155.
- Pontzer, H.**, Wrangham, R.W., (2006) The ontogeny of ranging in wild chimpanzees. *International Journal of Primatology*. 27, 295 – 309.
- Pontzer, H.**, Lieberman, D.E., Momin E., Devlin, M., Polk, J.D., Hallgrímsson, B., Cooper, D.M.L. (2006) Trabecular bone in the knee responds with high sensitivity to changes in load orientation. *Journal of Experimental Biology*. 209, 57 – 65.
- Pontzer, H.** (2005) A new model predicting locomotor cost from limb length *via* force production. *Journal of Experimental Biology*. 208, 1513 – 1524.
- Pontzer, H.**, Wrangham R.W. (2004) Climbing and the daily energy cost of locomotion in wild chimpanzees: Implications for hominoid locomotor evolution. *Journal of Human Evolution*. 46, 315 – 333.

Invited Talks

- 2009 Ape energetics and the Human Paradox
University of Missouri, Dept. of Anthropology
- 2009 Are orangutans the most efficient ape? Daily energy expenditure in hominoids.
Yale University, Dept. of Anthropology
- 2008 Mechanics and energetics of terrestrial locomotion.
Somatics of Dance Lecture Series, Washington University.
- 2008 Walking energetics in humans and chimpanzees: are humans the only efficient ape?
Washington University Physical Therapy Research Group.
- 2006 The effect of leg length on locomotor performance.
5th World Congress of Biomechanics. Session Chair: Dr. Alberto Minetti
- 2006 Limb design and locomotor performance in humans and other animals.
Stanford NeuroMuscular Biomechanics Lab.
- 2005 Limb length and locomotor cost, from ants to elephants.
SUNY Stony Brook Functional Morphology Group.

Recent Conference Presentations

- Pontzer, H.**, Ocobock, C., Shumaker, R.W., Raichlen, D.A. (2009) Daily energy expenditure in orangutans measured using doubly labeled water. AAPA Meetings. *AJPA*. S48, 213.
- Wittman, A.B., Cowgill, L.W., **Pontzer, H.**, Ocobock, C. (2009) Waddling and toddling: biomechanical effects of an immature gait. AAPA Meetings. *AJPA*. S48, 93.
- Erez, T., Smart, W.D., **Pontzer, H.** (2009) A new computational method for simulation and optimization of hominin gait. AAPA Meetings. *AJPA*. S48, 125

- Foster, A.D., Raichlen, D.A., **Pontzer, H.**, Sockol, M.D. (2009) Muscle force production during bent-knee, bent-hip walking in humans. AAPA Meetings. *AJPA*. S48, 129.
- Ocobock, C., **Pontzer, H.**, Atkinson, E., Shumaker, R.W., Wittman, A.B. (2009) Locomotor developmental timing in humans and other apes. AAPA Meetings. *AJPA*. S48, 201
- Pontzer, H.**, Kamilar, J.M. (2009) Great ranging associated with greater reproductive investment in mammals. Soc. Integ. Comp. Biol. Meetings.
- Pontzer, H.**, Raichlen, D.A., Sockol, M.D., (2008). Endurance versus efficiency in humans and chimpanzees: a new look at the old problem of becoming bipedal. *Hominin Bipedalism Symposium*, AAPA Meetings.
- Pontzer, H.**, Raichlen, D.A., Sockol, M.D., (2007). Locomotor energetics in chimpanzees, humans, and extinct hominins: contributions of muscular and skeletal anatomy. International Congress on Vertebrate Morphology.
- Pontzer, H.**, Raichlen, D.A., Lieberman, D.E. (2007). Is arm swing active or passive during human walking and running? Soc. Integ. Comp. Biol. Meetings.
- Pontzer, H.**, Raichlen, D.A., Sockol, M.D., (2007). Contributions of muscular and skeletal morphology to locomotor performance: How much can bones tell us about locomotion? *Primate Locomotion Symposium*, AAPA Meetings.
- Pontzer, H.** (2006). Hominid locomotor energetics and the emergence of the genus *Homo*. Paleanthropology Society Meetings.
- Pontzer, H.** (2006). Locomotor energetics and ranging ecology of fossil hominids. *Am. J. Phys. Anth.* Supp. 42, 148-148 *Awarded Aleš Hrdlička Prize.
- Pontzer, H.** (2006). Linking locomotor energetics to limb design in terrestrial animals. *Int. Comp. Biol.*, 2006 SICB Meetings Supplement. *Awarded D. Dwight Davis Prize.

Previous Appointments

- 2002 – 05 Teaching Fellow, Harvard University
- 1998 – 99 Teaching Assistant, Penn State University

Professional Service

- 2008 – 09 Scientific Committee member, American Association of Physical Anthropology Annual Meeting
- 2006 – 09 Student Prize Committee member, American Association of Physical Anthropology Annual Meeting.
- 2007 Co-Organizer, Principles of Primate Locomotion Symposium, American Association of Physical Anthropology Meeting.
- 2002 – 04 Co-Organizer, New England Biological Anthropology Symposium
- Reviewer for: Proceedings of the National Academy of Sciences; American Journal of Physical Anthropology; Journal of Human Evolution; Intl. Journal of Primatology;

Journal of Experimental Biology; Journal of Anatomy; Comparative Biochemistry and Physiology; Journal of Theoretical Biology; Journal of Biomechanics; Gait & Posture

Science in the Community

- 2009 Panel Discussant, *Chance Aesthetics* Public Exhibition
Mildred Kemper Art Museum, Washington University. Curator: Meredith Malone
- 2006 – 07 Consultant, Boston Science Museum
Human Physiology and Anatomy Exhibit. Curator: Tim Kardatzke
- 2006 *Science on Tap* Public Lecture, Schlafly Bottleworks, St. Louis
The Evolution of Bipedalism in Humans
- 2006 Featured Research, National Geographic Magazine
The Downside of Being Upright, by Jennifer Ackerman
- 2004 Science Advisor, National Geographic Television
Search for the Ultimate Survivor. Director: John Rubin