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Education

- Expected 8/2009 Ph.D. Anthropology, School of Human Evolution and Social Change, Arizona State University
Dissertation title: "Three-dimensional morphometrics and kinematics of the anthropoid wrist and the evolution of knuckle-walking in the Hominidae"
- 2003 M.A. Anthropology. Arizona State University
- 2000 B.A. Anthropology (minor in Biology), University of Colorado at Boulder.
Summa cum Laude with Distinction.
Honors thesis title: *Street ecology: population estimate, adaptive strategies and nutritional status of homeless youth in Denver, Colorado* (advisor Darna Dufour)

Current Research Interests

Paleoanthropology, primate evolution, functional and evolutionary morphology of the forelimb, primate locomotion and manipulative capabilities, biomechanics, the comparative method and adaptation in evolutionary biology

Academic Employment

- 2007-2008 Graduate Teaching Assistant, University of Arizona College of Medicine-Phoenix and School of Human Evolution and Social Change, Arizona State University
- 2006 Graduate Research Associate, School of Human Evolution and Social Change, Arizona State University
- 2004 Adjunct Professor, Mesa Community College, Mesa Arizona

Academic and Professional Associations

American Association of Physical Anthropologists
American Association of Anatomists
Sigma Xi: The Scientific Research Society

Peer-Reviewed Articles

- In press Larson SG, Jungers WL, Tocheri MW, **Orr CM**, Morwood MJ, Sutikna T, Awe Due R, Djubiantono T. Descriptions of the upper limb skeleton of *Homo floresiensis*. *Journal of Human Evolution*
- In press Marzke MW, Tocheri MW, Steinburg B, Femiani JD, Linscheid RL, **Orr CM**, Marzke RF. Comparative 3D quantitative analyses of trapeziometacarpal joint surface curvatures among living catarrhines and fossil hominins. *American Journal of Physical Anthropology*.
- 2008 Tocheri MW, **Orr CM**, Jacofsky MC, Marzke MW. The evolutionary history of the hominin hand since the last common ancestor of *Pan* and *Homo*. *Journal of Anatomy* 212:544-562.

Curriculum Vitae (C.M. Orr): August 2009

- 2007 Tocheri MW, **Orr CM**, Larson SG, Sutikna T, Jatmiko, Saptomo EW, Awe Due R, Djubiantono T, Moorewood MJ, Jungers WL. The primitive wrist of *Homo floresiensis* and its implications for hominin evolution. *Science* 317:1743-1745.
-This paper was recognized with a 2007 Science Achievement Award by the Smithsonian Institution
-See also: http://researchmag.asu.edu/2007/10/asu_prism_shines_new_light_on.html
- 2007 **Orr CM**, Delezene LK, Scott JE, Tocheri MW, Schwartz GT. The comparative method and the inference of venom delivery systems in fossil mammals. *Journal of Vertebrate Paleontology* 27:541-546.
- 2006 Wolfe SW, Crisco JJ, **Orr CM**, Marzke MW. The dart-thrower's motion of the wrist: is it unique to humans? *The Journal of Hand Surgery* 31:1429-1437.
- 2005 **Orr CM**. The knuckle-walking anteater: a convergence test of adaptation for purported knuckle-walking features of African Hominidae. *American Journal of Physical Anthropology* 128:639-658
- 2001 **Orr CM**, Dufour DL, Patton JQ. A comparison of anthropometric indices of nutritional status in Tukanoan and Achuar Amerindians. *The American Journal of Human Biology* 13:301-309.

Other Publications

- 1999 **Orr CM**. Making friends with Rex: metaphysics and the epistemology of New Humanist Anthropology. *Janus Head: Interdisciplinary Journal for Literature, Continental Philosophy, Phenomenological Psychology and the Arts* 2:138-41. (A rejoinder to Rex Olson's comments on "In defense of humanism")
- 1999 **Orr CM**. In defense of humanism: pragmatism, intention and faith (the problem of signification). *Janus Head: Interdisciplinary Journal for Literature, Continental Philosophy, Phenomenological Psychology and the Arts* 1:277-92.

Invited Presentations

- 2009 Orr CM. Wrist morphology and mechanics: implications for the study of human evolution. Midwestern University, Glendale, Arizona.
- 2008 **Orr CM**, Leventhal EL, Chivers FS, Crisco JJ. Kinematics of the os centrale in *Pongo pygmaeus*: implications for the knuckle-walking hominin ancestor hypothesis. Invited for a symposium entitled "Evolution of hominin bipedalism: new perspectives". Abstract in *American Journal of Physical Anthropology* Suppl 46:166.
- 2008 **Orr CM**. Locomotor hand postures and the evolution of the hominid wrist. Presentation for a symposium on the "Evolutionary Basis of Human Anatomy" at the annual meetings of the American Association of Anatomists in San Diego, California.
- 2005 **Orr CM**. "Knuckle-walking and the evolutionary anatomy of the hominoid wrist" Presented at the weekly hand-surgeon seminar at Cornell University's Weill Medical College, New York, New York.

Contributed Papers at Conferences (includes references for published abstracts)

- 2009 **Orr CM**, Leventhal EL, Chivers FS, Menzies SL, Larson S, Crisco JJ. Three-dimensional midcarpal kinematics during wrist extension in five anthropoid species. Abstract accepted for the 2009 American Association of Physical Anthropologists meetings in Chicago.
- 2009 Jungers WL, Falk D, Hildebolt C, Smith K, Prior F, Tocheri MW, **Orr CM**, Burnett SE, Larson SG, Djubiantono T, Morwood MJ. The hobbits (*Homo floresiensis*) were not cretins. Accepted for the 2009 American Association of Physical Anthropologists meetings in Chicago.

Curriculum Vitae (C.M. Orr): August 2009

- 2007 Tocheri MW, Jungers WL, Larson SG, **Orr CM**, Sutikna T, Jatmiko, Saptomo EW, Due RA, Djubiantono T, Morwood MJ. Morphological affinities of the wrist of *Homo floresiensis*. Annual meetings of the Paleoanthropology Society, Philadelphia, PA.
- 2006 **Orr CM**, Delezene LK, Scott JE, Schwartz GT, Tocheri MW. Anterior dental grooves and the inference of venom delivery systems in fossil mammals. *Journal of Vertebrate Paleontology* 26:107A-108A.
- 2006 Marzke MW, Tocheri MW, Femiani JC, **Orr CM**. Quadric-based methods for comparative curvature analysis and visualization of three-dimensional carpal joint surfaces in humans and nonhuman primates. International Wrist Investigators' Workshop, Washington, D.C.
- 2006 **Orr CM**, Raleigh LM. Electromyography of the brachial muscles during hard-hammer percussion production of Oldowan tools. Annual meetings of the Paleoanthropology Society, San Juan, Puerto Rico.
- 2006 **Orr CM**, Raleigh LM, Jacofsky M, Marzke MW. Moment arm of the triceps brachii and habitual forelimb position in primates. *American Journal of Physical Anthropology Suppl* 42:142
- 2006 Tocheri MW, **Orr CM**, Femiani JC, Marzke MW. Quadric-based metrics for shape analysis of three-dimensional osteological surfaces. Annual Meetings of the American Association of Physical Anthropologists, Anchorage, AL.
- 2006 **Orr CM**, Delezene LK, Scott JE, Schwartz GT, Tocheri MW. Canine grooves and the inference of venom delivery systems in Paleocene mammals. Graduates in the Earth, Life and Social Sciences Symposium, Arizona State University
- 2005 Tocheri MW, Scott JE, **Orr CM**, Williams, RC. A Monte Carlo simulation method for estimating interspecific scaling relationships in the absence of specimen-specific body mass data. *American Journal of Physical Anthropology* 126(S40):206-207
- 2005 **Orr CM**, Raleigh LM, Jacofsky M. The functional significance of olecranon process morphology in primates: measuring the triceps moment arm via tendon excursion. Graduates in the Earth, Life and Social Sciences Symposium, Arizona State University
- 2004 **Orr CM**. 3D analysis of hominoid radiocarpal joint structure and function: preliminary results. Graduates in the Earth, Life and Social Sciences Symposium, Arizona State University
- 2003 **Orr CM**. Knuckle-walking anteaters? Testing the hypothesis of adaptation for purported knuckle-walking features using a non-primate model. *American Journal of Physical Anthropology* 120(S36):162.
- 2002 **Orr CM**, Alemseged Z. Estimation of body mass and diet in fossil cercopithecids from the Asbole area of the Afar, Ethiopia. *American Journal of Physical Anthropology* 17(S34):120.

Competitive External Grant Funding

- 2006 National Science Foundation Doctoral Dissertation Improvement Grant (BCS-622515) for "Three-dimensional morphometrics and kinematics of the anthropoid wrist and the evolution of knuckle-walking" (\$6000). Co-principal investigator with Mary Marzke.
- 2006 Wenner-Gren Foundation Dissertation Fieldwork Grant for "Evolutionary morphology of the anthropoid wrist and the evolution of knuckle-walking in the Hominidae" (\$24,546). Co-principal investigator with Mark Spencer.
- 2006 Sigma Xi Grant-in-Aid of Research, for "Three dimensional morphometrics and arthrokinematics of the anthropoid wrist and the evolution of knuckle-walking" (\$400). Principal investigator.

Competitive Internal Grant Funding

2008	Travel Grant, Graduate and Professional Students Association, ASU (\$350)
2007	Travel Grant, School of Human Evolution and Social Change, ASU (\$300)
2006	Travel Grant, Graduate and Professional Students Association, ASU (\$400)
2006	Travel Grant, School of Human Evolution and Social Change, ASU (\$250)
2005	Research Support Grant for "Evolutionary morphology of the radiocarpal and midcarpal joints in primates with special reference to knuckle-walking", School of Human Evolution and Social Change, ASU (\$1000)
2005	Research Grant for "Functional morphology of the primate wrist and the evolution of knuckle-walking", Graduate and Professional Students Association, ASU (\$2000)
2002	Graduate Student Research Grant, Research & Development Committee, Department of Anthropology, Arizona State University (\$427)
1999	University of Colorado Undergraduate Research Opportunities Program (UROP) grant for honor's thesis, "Street Ecology" (\$750)
1997	University of Colorado UROP grant for "A comparison of the anthropometric indices of nutritional status in Tukanooan and Achuar Amerindians" (\$750)

Awards (Fellowships, Scholarships and Honors)

2008-2009	Graduate College Dissertation Fellowship, Arizona State University (\$17,000)
2006-2008	Dean's Advanced Scholarship (two-year guaranteed teaching/research assistantship + \$5000/year stipend supplement), Arizona State University
2003-2006	National Science Foundation IGERT Fellowship (tuition, \$30,000/year stipend, \$3000 research funds, \$1000 travel funds)
2002	Honorable Mention, National Science Foundation Graduate Research Fellowship Competition
2000-2003	Institute of Human Origins Fellowship in Paleoanthropology (tuition, \$11,000/year stipend)
2000	The Outstanding Undergraduate Award, Department of Anthropology, University of Colorado at Boulder.
2000	Val B. and Helen W. Fisher Scholarship for Academic Excellence and Community Service (\$500)
1999	Alison Preston Goodheart Community Service Scholarship (\$2250)

Field Work Experience

2004	Research team member, Sopenña Archaeological Project, Middle/Upper Paleolithic, Asturias Region of Spain (Director: Ana Pinto)
2001	Research team member, Institute of Human Origins Hadar Research Project, Plio/Pleistocene, Ethiopia (Directors: William Kimbel and Donald Johanson)
2001	Research team member, University of Colorado Natural History Museum Expedition to the Bridger Formation, Eocene, SW Wyoming (Director: Paul Murphey)

Teaching Experience

As primary or co-instructor-

2007	Comparative Primate Anatomy (ASM 494/591) - Co-instructor through Graduate Mentorship Training Program, School of Human Evolution and Social Change, Arizona State University -Helped redesign course curriculum, lectured, and taught lab component of course -Included human and nonhuman primate cadaver dissection (all major anatomical regions)
2004	Introduction to Physical Anthropology (lecture + lab), Mesa Community College - primary lecturer and lab instructor

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As graduate teaching assistant-

- 2008 Bones, Stones and Human Evolution (ASM 104), Arizona State University
-Teaching assistant and instructor for two lab sections
- 2007 Clinical Anatomy, University of Arizona College of Medicine-Phoenix
-Teaching assistant for first year medical students
-Completed human cadaver prosections (all major anatomical regions) and taught course lab component
- 2001 Introduction to Human Anatomy Lab (EPOB 3420), University of Colorado, Boulder
-Volunteer teaching assistant for undergraduate biology majors
-Helped teach course lab component (included prosected human cadavers)
- 1997-98, 2000 Undergraduate Teaching Assistant, Laboratory in Biological Anthropology (ANTH 2040),
University of Colorado, Boulder (for school credit or volunteer)

Special Methodological Training

- 2003-06 National Science Foundation Interdisciplinary Graduate Research Training Program in Neural and
Musculoskeletal Adaptation in Form and Function
-Interdisciplinary coursework in anatomy, biomechanics, neurophysiology and computer visualization completed
with other graduate students in bioengineering, kinesiology, biology and computer science
- Computer visualization using laser-scanning and computed tomography, three-dimensional morphometrics,
univariate and multivariate statistics, vertebrate dissection, tendon-excursion technique for measuring muscle
moment arms, electromyography,

Special Software Familiarity

3D graphics and modeling: Mimics, Geomagic
Computation and statistics: MATLAB, Statistica, SAS

Academic Service

- 2007 Project Medical Education
-anatomy dissections and demonstrations for public visitors to the University of Arizona College of
Medicine-Phoenix
- 2005-2006 Committee member, Graduates in the Earth Life and Social Sciences (GELSS) organization, Arizona State
University
-principal organizer of the GELSS public panel discussion on "Race in Academia" featuring Nina Jablonski
(biological anthropologist, California Academy of Sciences)
- 2000-present Institute of Human Origins Tour Guide and Public Lecturer (dozens of public lectures on the human fossil
record and paleoanthropology to tour groups of all ages)
- 2000-2001 Physical Anthropology Graduate Representative, Arizona State University

Manuscript Peer Review Service

Journal of Vertebrate Paleontology

Nonacademic Community Service

- 1998-2000 Street counselor for homeless adolescents, Stand Up for Kids, San Diego and Denver
1998-1999 Corps Member, AmeriCorps National Civilian Community Corps, Western Region

Reference Contact Information

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<http://www.asu.edu/clas/iho/people/spencer.html>

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