

# Aaron Caldwell

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## ORISE Postdoctoral Fellow

*Aaron is a Oak Ridge Institute for Science and Education (ORISE) postdoctoral fellow at the US Army Research Institute for Environmental Medicine (USARIEM). His research focuses on the effects of extreme environments on human performance and the application of statistical inference in sport and exercise science.*

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### Employment

- 2019-Present **Postdoctoral Fellowship**, *US Army Research Institute of Environmental Medicine*, Natick, MA.
- Stationed in the Thermal and Mountain Medicine Division.
- 2015-2019 **Graduate Assistant**, *University of Arkansas*, Fayetteville, AR.
- Research and Teaching Duties in the Health, Human Performance, and Recreation Department.

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### Education

- 2015 - 2019 **Ph.D. Health, Sport & Exercise Science**, *University of Arkansas*, Fayetteville, Arkansas.
- National Science Foundation - Professional Awareness, Advancement, & Development (PAAD) Awardee ([nsfpaad.uark.edu](http://nsfpaad.uark.edu))
  - Graduate Certificate in Statistics & Research Methods
- 2013 - 2015 **M.Sc. Kinesiology**, *Texas Christian University*, Fort Worth, Texas.
- Graduate Certificate in Pedagogy
- 2009 - 2013 **B.Sc. Exercise Science**, *Baker University*, Baldwin City, Kansas.
- Minor in Biology

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Peer-Reviewed

- 1 C. X. Muñoz, E. C. Johnson, L. J. Kunces, A. L. McKenzie, M. Wininger, C. L. Butts, A. Caldwell, A. Seal, B. P. McDermott, J. Vingren, A. T. Colburn, S. S. Wright, V. Lopez III, L. E. Armstrong, and E. C. Lee, "Impact of Nutrient Intake on Hydration Biomarkers Following Exercise and Rehydration Using a Clustering-Based Approach," *Nutrients*, vol. 12, no. 5, p. 1276, Apr. 2020 [Online]. Available: <http://dx.doi.org/10.3390/nu12051276>
- 2 M. Tenan, A. D. Vigotsky, and A. R. Caldwell, "On the Statistical Properties of the Dankel-Loenneke Method," Oct. 2019 [Online]. Available: <http://dx.doi.org/10.31236/osf.io/8ndhg>
- 3 M. A. Tucker, A. R. Caldwell, and M. S. Ganio, "Adequacy of Daily Fluid Intake Volume Can Be Identified From Urinary Frequency and Perceived Thirst in Healthy Adults," *Journal of the American College of Nutrition*, vol. 39, no. 3, pp. 235–242, Jul. 2019 [Online]. Available: <http://dx.doi.org/10.1080/07315724.2019.1639566>
- 4 A. R. Caldwell and S. N. Cheuvront, "Basic statistical considerations for physiology: The journal Temperature toolbox," *Temperature*, vol. 6, no. 3, pp. 181–210, Jun. 2019 [Online]. Available: <http://dx.doi.org/10.1080/23328940.2019.1624131>
- 5 J. C. Veilleux, A. R. Caldwell, E. C. Johnson, S. Kavouras, B. P. McDermott, and M. S. Ganio, "Examining the links between hydration knowledge, attitudes and behavior," *European Journal of Nutrition*, vol. 59, no. 3, pp. 991–1000, Apr. 2019 [Online]. Available: <http://dx.doi.org/10.1007/s00394-019-01958-x>
- 6 K. M. Gallagher, M. Payne, B. Daniels, A. R. Caldwell, and M. S. Ganio, "Walking breaks can reduce prolonged standing induced low back pain," *Human Movement Science*, vol. 66, pp. 31–37, Aug. 2019 [Online]. Available: <http://dx.doi.org/10.1016/j.humov.2019.03.012>
- 7 K. Peterson and A. Caldwell, "mbir: Magnitude-Based Inferences," *Journal of Open Source Software*, vol. 4, no. 33, p. 746, Jan. 2019 [Online]. Available: <http://dx.doi.org/10.21105/joss.00746>
- 8 M. E. Rosa-Caldwell, C. Todden, A. R. Caldwell, and L. E. Breithaupt, "Confidence in eating disorder knowledge does not predict actual knowledge in collegiate female athletes," *PeerJ*, vol. 6, p. e5868, Oct. 2018 [Online]. Available: <http://dx.doi.org/10.7717/peerj.5868>
- 9 A. R. Caldwell, J. Burchfield, N. E. Moyan, M. A. Tucker, C. L. Butts, R. J. Elbin, and M. S. Ganio, "Obesity, but not hypohydration, mediates changes in mental task load during passive heating in females," *PeerJ*, vol. 6, p. e5394, Aug. 2018 [Online]. Available: <http://dx.doi.org/10.7717/peerj.5394>
- 10 A. R. Caldwell, K. M. Gallagher, B. T. Harris, M. E. Rosa-Caldwell, M. Payne, B. Daniels, and M. S. Ganio, "Prolonged standing increases lower limb arterial stiffness," *European Journal of Applied Physiology*, vol. 118, no. 10, pp. 2249–2258, Aug. 2018 [Online]. Available: <http://dx.doi.org/10.1007/s00421-018-3956-2>

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- 11 M. A. Tucker, A. R. Caldwell, C. L. Butts, F. B. Robinson, S. A. Kavouras, B. P. McDermott, T. A. Washington, R. C. Turner, and M. S. Ganio, "Postsynaptic cutaneous vasodilation and sweating: influence of adiposity and hydration status," *European Journal of Applied Physiology*, vol. 118, no. 8, pp. 1703–1713, May 2018 [Online]. Available: <http://dx.doi.org/10.1007/s00421-018-3902-3>
- 12 B. P. McDermott, C. R. Smith, C. L. Butts, A. R. Caldwell, E. C. Lee, J. L. Vingren, C. X. Munoz, L. J. Kunces, K. Williamson, M. S. Ganio, and L. E. Armstrong, "Renal stress and kidney injury biomarkers in response to endurance cycling in the heat with and without ibuprofen," *Journal of Science and Medicine in Sport*, vol. 21, no. 12, pp. 1180–1184, Dec. 2018 [Online]. Available: <http://dx.doi.org/10.1016/j.jsams.2018.05.003>
- 13 D. Lakens, ... A.R. Caldwell, "Justify your alpha," *Nature Human Behaviour*, vol. 2, no.3, pp. 168–171, Feb. 2018 [Online]. Available: <http://dx.doi.org/10.1038/s41562-018-0311-x>
- 14 C. L. Butts, D. L. Spisla, J. Adams, C. R. Smith, K. M. Paulsen, A. R. Caldwell, M. S. Ganio, and B. P. McDermott, "Effectiveness of Ice-Sheet Cooling Following Exertional Hyperthermia," *Military Medicine*, vol. 182, no. 9, pp. e1951–e1957, Sep. 2017 [Online]. Available: <http://dx.doi.org/10.7205/MILMED-D-17-00057>
- 15 A. R. Caldwell, F. B. Robinson, M. A. Tucker, C. H. Arcement, C. L. Butts, B. P. McDermott, and M. S. Ganio, "Effect of passive heat stress and exercise in the heat on arterial stiffness," *European Journal of Applied Physiology*, vol. 117, no. 8, pp. 1679–1687, Jun. 2017 [Online]. Available: <http://dx.doi.org/10.1007/s00421-017-3658-1>
- 16 A. R. Caldwell, M. A. Tucker, J. Burchfield, N. E. Moyan, A. Z. Satterfield, A. Six, B. P. McDermott, S. W. Mulvenon, and M. S. Ganio, "Hydration status influences the measurement of arterial stiffness," *Clinical Physiology and Functional Imaging*, vol. 38, no. 3, pp. 447–454, Apr. 2017 [Online]. Available: <http://dx.doi.org/10.1111/cpf.12436>
- 17 A. R. Caldwell, M. A. Tucker, C. L. Butts, B. P. McDermott, J. L. Vingren, L. J. Kunces, E. C. Lee, C. X. Munoz, K. H. Williamson, L. E. Armstrong, and M. S. Ganio, "Effect of Caffeine on Perceived Soreness and Functionality Following an Endurance Cycling Event," *Journal of Strength and Conditioning Research*, vol. 31, no. 3, pp. 638–643, Mar. 2017 [Online]. Available: <http://dx.doi.org/10.1519/jsc.0000000000001608>
- 18 M. A. Tucker, A. R. Caldwell, C. L. Butts, F. B. Robinson, H. C. Reynebeau, S. A. Kavouras, B. P. McDermott, T. A. Washington, R. C. Turner, and M. S. Ganio, "Effect of hypohydration on thermoregulatory responses in men with low and high body fat exercising in the heat," *Journal of Applied Physiology*, vol. 122, no. 1, pp. 142–152, Jan. 2017 [Online]. Available: <http://dx.doi.org/10.1152/jappphysiol.00768.2016>
- 19 J. M. Oliver, L. Stoner, D. S. Rowlands, A. R. Caldwell, E. Sanders, A. Kreutzer, J. B. Mitchell, M. Purpura, and R. Jäger, "Novel Form of Curcumin Improves Endothelial Function in Young, Healthy Individuals: A Double-Blind Placebo Controlled Study," *Journal of Nutrition and Metabolism*, vol. 2016, pp. 1–6, 2016 [Online]. Available: <http://dx.doi.org/10.1155/2016/1089653>

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- 20 J. M. Oliver, D. P. Joubert, A. Caldwell, S. E. Martin, and S. F. Crouse, “A longitudinal study examining the effects of a season of American football on lipids and lipoproteins,” *Lipids in Health and Disease*, vol. 14, no. 1, Apr. 2015 [Online]. Available: <http://dx.doi.org/10.1186/s12944-015-0021-6>
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### Preprints

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- 1 A. R. Caldwell and A. D. Vigotsky, “Does One Effect Size Fit All? The Case Against Default Effect Sizes for Sport and Exercise Science,” May 2020 [Online]. Available: <http://dx.doi.org/10.31236/osf.io/tfx95>
  - 2 A. R. Caldwell, L. T. Jansen, M. E. Rosa-Caldwell, E. K. Howie, K. M. Gallagher, R. C. Turner, and M. S. Ganio, “Combined Effects of Standing and Passive Heating on Attenuating Sitting-Induced Vascular Dysfunction,” May 2020 [Online]. Available: <http://dx.doi.org/10.1101/2020.04.30.060087>
  - 3 D. Lakens and A. R. Caldwell, “Simulation-Based Power-Analysis for Factorial ANOVA Designs,” May 2019 [Online]. Available: <http://dx.doi.org/10.31234/osf.io/baxsf>
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## Presentations & Conference Proceedings

### Invited Lectures and Presentations

- Fall 2015 **Effect of caffeine on muscle soreness and mood**, *Seminar at University of Arkansas.*
- Fall 2016 & Fall 2017 **Hydration & Performance**, *Graduate Course - Physiology of Exercise.*
- Spring 2017 **Exercise Testing**, *Undergraduate Course - Exercise Prescription.*
- 2017 **Measuring Sweat Gland Activation**, *Experimental Biology 2017.*
- 2018 **Coaching considerations for Hydration and Heat Stroke**, *Kendrick Fincher Coaching Summit.*

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### Poster Presentations

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- 1 Caldwell, A.R., Ward, M.D., Gabrial, C., Leon, L. R., Charkoudian, N. (2020) Sex Differences In The Clinical Sequelae Of Exertional Heat Stroke In Military Servicemembers, *Medicine and Science in Sport and Exercise*, 52(7S).  
<https://doi.org/10.1249/01.mss.0000686632.03589.68>
  - 2 Caldwell, A.R., Jansen, L.T., Rosa-Caldwell, M.E., Turner, R.C., Howie, E.K., Gallagher, K.M., Ganio, M.S. (2019) Independent and Combined Effects of Arterial Angulations and Shear Stress on Vascular Function, *Medicine and Science in Sports and Exercise*, 51(6S), <https://doi.org/10.1249/01.mss.0000563478.44953.54>
  - 3 Caldwell, A. R., Harris, B. T., Rosa-Caldwell, M. E., Payne, M., Daniels, B., Gallagher, K. M., & Ganio, M. S. (2018). Prolonged Standing Increases Lower Peripheral Arterial Stiffness Independent Of Walking Breaks. *Medicine and Science in Sport and Exercise*, 50(5S). <https://doi.org/10.1249/01.mss.0000536898.09085.57>
  - 4 Caldwell, A. R., Robinson, F. B., Tucker, M. A., Arcement, C. H., Butts, C. L., McDermott, B. P., & Ganio, M. S. (2017). Independent and Combined Effects of Heat Stress and Exercise on Arterial Stiffness. *Medicine and Science in Sport and Exercise*, 49(5S), 63. <https://doi.org/10.1249/01.mss.0000516998.51451.67>
  - 5 Caldwell AR, Tucker MA, Butts CL, McDermott BP, Vingren JL, Kunces LJ, Lee EC, Munoz CX, Williamson K, Armstrong LE, Ganio MS. (2016). Effect of Caffeine on Recovery from an Endurance Cycling Event. *Medicine and Science in Sport and Exercise*. 48(5S); 64. <https://doi.org/10.1519/JSC.0000000000001608>
  - 6 Caldwell AR, Oliver JM, Martin SE, Crouse SF. (2015). Risk Factors associated with Dyslipidemia in Football Athletes over the course of a season. *Medicine and Science in Sport and Exercise*. 47(5S); 656.  
<https://doi.org/10.1249/01.mss.0000478507.91089.2d>
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## Grants & Awards

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- July 2018 **Ph.D. Student Research Grant**, *Central States - American College of Sports Medicine*.
- Investigate the role of biological sex in interventions to prevent vascular dysfunction during prolonged sitting.
- January 2014 **Student Research Development Award**, *Texas Chapter - American College of Sports Medicine*.
- Effect of Cardiorespiratory Fitness on Platelet-Monocyte Interactions

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## Skills & Techniques

### Statistics and Research Methods

- Primary programming in R/SAS with experience in SPSS and Python
- Experience utilizing ordinary least squares (OLS) and multi-level models
- Statistics reviewer for the American Physiological Society

### Exercise and Performance Testing

- Graded exercise testing
- Wingate testing
- Exercise and resting open circuit spirometry
- 7-site skinfold body composition assessment

### Laboratory Procedures

- Phlebotomy
- Carbon monoxide rebreathing for estimating blood volume
- Ultrasound assessment of flow-mediated dilation and pulse-wave velocity
- Laser-Doppler assessment of cutaneous vascular conductance
- Skin microdialysis
- Refractometer determination of urine specific gravity
- Freezing-point depression determination of osmolality
- Measurement of local sweat rate and sweat gland activation
- Enzyme-linked immunoassays (ELISA)
- Spectrophotometric assays
- Dual-energy x-ray absorptiometry (DXA) operation

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## Service

### Outreach

- Helping create statistical teaching materials for the American Physiological Society
- Running the Numbers
  - Working with colleagues to develop a website to help with statistics and methodology related problems in exercise & sport physiology
  - Topics: metascience, statistical techniques, scientific writing standards
- Society for Transparency, Openness, and Replication in Kinesiology (STORK)
  - Founding board member
  - A platform for kinesiologists, movement scientists, sport and exercise scientists, physical activity and health scientists to come together to improve methods and practices within our respective disciplines
- Elected to the steering board as the chair of our preprint service
  - SportRxiv

### Reviewer

- Physical Medicine and Rehabilitation (PM&R)
- PLOS One
- American Journal of Physiology - Heart and Circulatory Physiology
- American Journal of Physiology - Renal Physiology
- Journal of Neurophysiology

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- Sports Medicine
- International Journal of Sport Nutrition & Exercise Metabolism
- Journal of Athletic Training
- Journal of Thermal Biology
- Journal of Strength and Conditioning Research
- Journal of Physiology

#### Professional Memberships

- American College of Sports Medicine
- American Physiological Society
- American Statistical Association

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