

Samuel Robert LaMunion

Curriculum Vitae

National Institutes of Health

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EDUCATION AND RESEARCH TRAINING

Postdoctoral Intramural Research Training Award (IRTA) Fellow

The National Institutes of Health – Bethesda, MD

National Institute of Diabetes, Digestion, and Kidney Diseases

Diabetes, Endocrinology, and Obesity Branch

Human Energy and Body Weight Regulation Core

Metabolic Clinical Research Unit

Mentor: Dr. Kong Chen, Ph.D., MSCI

Doctor of Philosophy – May 2020

The University of Tennessee, Knoxville – Knoxville, TN

Department of Kinesiology, Recreation, and Sport Studies

Concentration: Kinesiology

Specialization: Exercise Physiology

Minors: Epidemiology & Statistics

Major Professor: Dr. Scott Crouter, Ph.D.

Dissertation – *“Using ActiGraph GT9X Accelerometer and Gyroscope Data for Characterizing Youth Physical Activity”*

Master of Science – August 2016

The University of Tennessee, Knoxville – Knoxville, TN

Department of Kinesiology, Recreation, and Sport Studies

Concentration: Kinesiology

Specialization: Exercise Physiology

Major Professor: Dr. Scott Crouter, Ph.D.

Thesis – *“The Effects of ActiGraph Bandpass Filtering on Activity Counts During Continuous and Intermittent Lifestyle Activity”*

Bachelor of Science – August 2014

University of South Carolina Aiken – Aiken, SC

Department of Exercise and Sports Science

Concentration: Basic Sciences

Advisor: Dr. Brian Parr, Ph.D.

HONORS AND AWARDS

- Andy Kozar Graduate Research Scholarship (2019-2020)
- Tennessee Fellowship for Graduate Excellence (2019-2020)
- Extraordinary Professional Promise Citation (2019-2020)
- Andy Kozar Graduate Research Scholarship (2018-2019)

- Tennessee Fellowship for Graduate Excellence (2018-2019)
- Chancellor's Fellowship Award (2016-2017)
- Outstanding Student in Exercise and Sports Science Award Recipient 2014
- USC Aiken Leadership Program Certificate 2014
- H. Mac Johnston Scholarship Award Recipient 2014
- South Carolina LIFE Scholar 2010-2014
- Alumni Association Leadership Scholarship Recipient 2012-2014

TEACHING EXPERIENCE

The National Institutes of Health

Office of Intramural Training and Education

- Summer Journal Club Co-Leader – Summer 2021
 - Going Digital: Bringing Mobile Health and Wearable Technology to Clinical Trials

The University of Tennessee, Knoxville

Department of Kinesiology, Recreation, and Sport Studies

- Graduate Teaching Assistant for Dr. Scott Crouter, Ph.D. – Fall 2019
 - KNS 532: Graduate Physiology of Exercise Lab
- Graduate Teaching Assistant for Dr. Scott Crouter, Ph.D. – Fall 2018
 - KNS 532: Graduate Physiology of Exercise Lab
- Guest Lecture for Dr. Scott Crouter, Ph.D. – November 15, 2017
 - KNS 532: Graduate Physiology of Exercise: Hormonal Responses to Exercise
- Graduate Teaching Assistant for Dr. Scott Crouter, Ph.D. – Fall 2017
 - KNS 532: Graduate Physiology of Exercise Lab
- Graduate Teaching Assistant for Dr. Lyndsey Hornbuckle, Ph.D. – May 2017
 - KNS 414: Exercise Testing and Prescription Lab
- Guest Lecture for Mr. William Boyer, MSH – April 20, 2017
 - KNS 350 Physical Activity Epidemiology – “Special Topics: Novel Approaches National Institutes of Health RO1 Grant Overview”
- Guest Lecture for Mr. William Boyer, MSH – March 2, 2017
 - KNS 350 Physical Activity Epidemiology – “Physical Activity Measurement”
- Guest Lecture for Dr. Scott Crouter, Ph.D. – October 28, 2016
 - KNS 532 Graduate Physiology of Exercise Lab– “Muscle Fatigue and the Force Velocity Curve”
- Guest Lecture for Dr. David Bassett, Ph.D. – April 28, 2016
 - KNS 380 Special Topics: Physiology of the Athlete – “Athletes and Aging”

University of South Carolina Aiken

Office of Student Life – Vice Chancellor for Student Life and Services: Ahmed Samaha

Teaching Assistant for Leadership Programs | August 2011- June 2014

- ASUP 110 Emerging Leaders
- ASUP 210 Citizen Leadership
- ASUP 310 Leadership Exchange

RESEARCH PUBLICATIONS

Refereed Publications

1. Bassett DR Jr., Toth LP, **LaMunion SR**, Crouter SE. Step Counting: Measurement Considerations and Health Implications. *Sports Medicine*. 2016:1-13. DOI: 10.1007/s40279-016-0663-1.
2. Toth LP, Bassett DR Jr., Crouter SE, Overstreet BS, **LaMunion SR**, Park S, Notta SN, Springer CM. StepWatch Accuracy during Walking, Running, and Intermittent Activities. *Gait and Posture*. 2017; 52:165-70. DOI: 10.1016/j.gaitpost.2016.11.035.

3. **LaMunio SR**, Bassett DR Jr., Toth LP, Crouter SE. The Effect of Body Placement Site on ActiGraph wGT3X-BT Activity Counts. *Biomedical Physics and Engineering Express*. 2017;3(3). DOI: 10.1088/2057-1976/aa777c.
4. Hibbing PR, **LaMunio SR**, Kaplan AS, Bassett DR Jr, Crouter SE. ActiGraph GT9X Inertial Measurement Unit Improves Physical Activity Energy Expenditure Models. *Medicine and Science in Sports and Exercise*. 2018; 50(5):1093-1102. DOI: 10.1249/MSS.0000000000001532.
5. Shaghayegh G, Yeh CM, Ding Y, Ding W, Hibbing P, **LaMunio S**, Kaplan A, Crouter SE, & Keogh E. Domain Agnostic Online Semantic Segmentation for Multi-Dimensional Time Series. *Data Mining and Knowledge Discovery*. Published online September 25, 2018. DOI:10.1007/s10618-018-0589-3.
6. Crouter SE, Hibbing PR, and **LaMunio SR**. Objective Measures of Sedentary Time in Youth. *Journal for the Measurement of Physical Behaviour*. 2018; 1:136-142. DOI:10.1123/jmpb.2018-0007.
7. **LaMunio SR**, Blythe AL, Hibbing PR, Kaplan AS, Clendenin BJ, Crouter SE. Use of Consumer Monitors for Estimating Energy Expenditure in Youth. *Applied Physiology, Nutrition, and Metabolism*. 2019; (Online First), DOI: 10.1139/apnm-2019-0129.
8. Crouter SE, Bassett DR, **LaMunio SR**, Hibbing PR, Kaplan AS, Clendenin BJ. Validation of the Cosmed K5 Portable Metabolic System. *PLOS ONE*. 2019; 14(12). DOI: 10.1371/journal.pone.0226290.
9. **LaMunio SR**, Fitzhugh EC, and Crouter SE. Challenges and Opportunities Related to the Objective Assessment of Physical Activity through United States Surveillance Systems. *Annals of Epidemiology*. 2020 Mar;43:1-10. DOI: 10.1016/j.annepidem.2020.01.011.
10. Hibbing PR, **LaMunio SR**, Hilafu H, Crouter SE. (2020) Evaluating the Performance of Bout Detection Algorithms for Wearable Sensors: The Transition Pairing Method. *Journal for the Measurement of Physical Behaviour*. 2020; 3(3):219-227. DOI: 10.1123/jmpb.2019-0039.
11. Hibbing PR, Bassett DR, Coe DP, **LaMunio SR**, Crouter SE. Resting Energy Expenditure and Metabolic Equivalents in Youth: Impact of Inconsistent Operational Definitions. *Medicine and Science in Sports and Exercise*. 2020 Aug; 52(8):1846-1853. DOI: 10.1249/MSS.0000000000002299.
12. **LaMunio SR**, Crouter SE, Broskey NT, Altazan AD, Redman, LM. Discrimination of wear and non-wear in infants using data from hip- and ankle-worn devices. *PLOS ONE*. 2020; 15(11):e0240604. DOI: 10.1371/journal.pone.0240604.

Non-Refereed Publications

1. Hibbing PR, **LaMunio SR**, Toth LP. Fitness Trackers can be Fashionable and Functional. *ACSM Fit Society Page*. 2017;17(3):3. Submitted 14 July 2017.

In Review

1. Crouter SE, Hibbing PR, **LaMunio SR**. Chapter 8. Physical Activity Assessment. *Academy of Nutrition and Dietetics' Health Professionals Guide to Weight Management for Adults*.

In Preparation

1. **LaMunio SR**, Nguyen J, Brychta RJ, Troiano RP, Friedl KE, Chen KY. Validation of the ActiGraph GT3X+, wGT3X-BT, GT9X, and CentrePoint Insight Watch Accelerometers using a Mechanical Oscillator. Target Journal: *Medicine and Science in Sports and Exercise*.
2. **LaMunio SR**, Brychta RJ, Chen KY. 'Wear Fatigue': Does accelerometer wear compliance wane over a free-living assessment period? Target Journal: *Journal for the Measurement of Physical Behavior*.

3. **LaMunio SR**, Hibbing PR, Hilafu HT, Weinhandl J, Fitzhugh EF, Crouter SE. Classification of ActiGraph GT9X Accelerometer and Gyroscope Data for Characterizing Youth Physical Activity. Target Journal: *Medicine and Science in Sports and Exercise*.
4. Hibbing PR, **LaMunio SR**, Hilafu HT, Coe DP, Bassett DR, Crouter SE. Calibration and Validation of Gyroscope Inclusive Youth Sojourn Models. Target Journal: *Medicine and Science in Sports and Exercise*.

RESEARCH PRESENTATIONS

National/International Abstracts and/or Presentations

1. **LaMunio SR**, Celec AN, Burr SD, Parr BB, McLaughlin JE, King GA. Accuracy of the Azumio Instant Heart Rate App for Measuring Resting and Exercise Heart Rate. *Medicine and Science in Sports and Exercise*. 46(5S):296, May 2014. Thematic Poster Presentation. National American College of Sports Medicine Annual Meeting (ACSM), Orlando, FL.
2. **LaMunio SR**, Bassett DR, Crouter SE. Effects of Changing ActiGraph Bandpass Filter Width for Detecting Walking and Running. *Medicine and Science in Sports and Exercise*. 48(5S):546-547, May 2016. Poster Presentation: National American College of Sports Medicine Annual Meeting (ACSM), Boston, MA.
3. Kaplan AS, **LaMunio SR**, Bassett DR, Crouter SE. Improved Count Based Metrics for Estimation of Energy Expenditure with Waist Worn ActiGraph. *Medicine and Science in Sports and Exercise*. 49(5S):647, May 2017. Poster Presentation: National American College of Sports Medicine Annual Meeting (ACSM), Denver, CO. May 2017.
4. **LaMunio SR**, Toth LP, Bassett DR, Crouter SE. Effect of Wear Location on ActiGraph Activity Counts. *Medicine and Science in Sports and Exercise*. 49(5S):643-644, May 2017. Poster Presentation: National American College of Sports Medicine Annual Meeting (ACSM), Denver, CO.
5. Crouter SE, Hibbing PR, **LaMunio SR**, Bassett DR. Use of the ActiGraph GT9X Inertial Measurement Unit to Predict Energy Expenditure. Slide Presentation: International Conference on Ambulatory Monitoring of Physical Activity and Movement (ICAMPAM), Bethesda, MD. June 2017.
6. Hibbing PR, **LaMunio SR**, Bassett DR, Crouter SE. Impact of Inertial Measurement Unit on Activity Recognition using ActiGraph GT9X Accelerometers on the Hip, Wrists, and Ankles. Poster Presentation: International Conference on Ambulatory Monitoring of Physical Activity and Movement (ICAMPAM), Bethesda, MD. June 2017.
7. **LaMunio SR**, Hibbing PR, Bassett DR, Crouter SE. Application of the ActiGraph GT9X IMU to Estimate Energy Expenditure. Slide Presentation: International Conference on Ambulatory Monitoring of Physical Activity and Movement (ICAMPAM), Bethesda, MD. June 2017.
8. Crouter SE, **LaMunio SR**, Hibbing PR, Bassett DR. Use of a 2-Regression Model to Estimate Energy Expenditure using the ActiGraph GT9X IMU. Slide Presentation: Recent Advances and Controversies in Measuring Energy Metabolism (RACMEM). Fribourg, Switzerland. October 2017.
9. **LaMunio SR**, Hibbing PR, Bassett DR, Crouter SE. Use of the ActiGraph GT9X Inertial Measurement Unit to Predict Energy Expenditure Using Artificial Neural Networks. Slide Presentation: Recent Advances and Controversies in Measuring Energy Metabolism (RACMEM). Fribourg, Switzerland. October 2017.
10. Kaplan AS, **LaMunio SR**, Hibbing PR, Crouter SE. Use of Consumer Monitors for Estimating Energy Expenditure in Youth. *Medicine and Science in Sports and Exercise*. Slide Presentation: National American College of Sports Medicine Annual Meeting (ACSM), Minneapolis, MN.
11. Parr BB, **LaMunio SR**, Jolley AP, Hatchett AG. Relationship Between Body Mass Index, Core Strength, and Balance in Adults. *Medicine and Science in Sports and Exercise*. Poster Presentation: National American College of Sports Medicine Annual Meeting (ACSM), Minneapolis, MN.

12. **LaMunio SR**, Hibbing PR, Kaplan AS, Crouter SE. Physical Activity Category Classification using the ActiGraph GT9X in Youth. *Medicine and Science in Sports and Exercise*. Poster Presentation: National American College of Sports Medicine Annual Meeting (ACSM), Minneapolis, MN.
13. Crouter SE, **LaMunio SR**, Hibbing PR, Kaplan AS, Quarantillo ME, Bassett DR. Accuracy of the Cosmed K5 Portable Metabolic System. *Medicine and Science in Sports and Exercise*. Slide Presentation: National American College of Sports Medicine Annual Meeting (ACSM), Orlando, FL.
14. Crouter SE, Clendenin BJ, Hibbing PR, and **LaMunio SR**. Validity of Consumer Monitors for Estimating Steps in Youth. Slide Presentation: International Conference on Ambulatory Monitoring of Physical Activity and Movement (ICAMPAM), Maastricht, Netherlands, June 2019.
15. Hibbing PR, **LaMunio SR**, Hilafu H, and Crouter SE. Evaluating the Performance of Bout Detection Algorithms for Wearable Sensors: The Transition Pairing Method. Slide Presentation. International Conference on Ambulatory Monitoring of Physical Activity and Movement (ICAMPAM), Maastricht, Netherlands, June 2019.
16. **LaMunio SR** and Crouter SE. Exploration of ActiGraph GT9X Primary Accelerometer Data Stability. Poster Presentation. International Conference on Ambulatory Monitoring of Physical Activity and Movement (ICAMPAM), Maastricht, Netherlands, June 2019.
17. Crouter SE (presented by **LaMunio SR**), Chen KY, Plasqui G, and Kozey-Keadle S. How Good Are Our Criterion Measures for Accelerometer Development and Validation? Pre-Conference Workshop. International Conference on Ambulatory Monitoring of Physical Activity and Movement (ICAMPAM), Maastricht, Netherlands, June 2019.
18. **LaMunio SR**, Crouter SE, Broskey NT, Altazan AD, Redman LM. Identification of ActiGraph wGT3X-BT Device Non-Wear in Infants. Poster Presentation (Virtual – Not Presented). American College of Sports Medicine Annual Meeting (ACSM), San Francisco, CA. May 2020.
19. Hukka MK, **LaMunio SR**, Hibbing PR, Crouter SE. Generational Differences of Consumer Wearable Devices for Estimating Physical Activity Outcomes. Poster Presentation (Virtual – Not Presented). American College of Sports Medicine Annual Meeting (ACSM), San Francisco, CA. May 2020.
20. **LaMunio SR**, Nguyen J, Brychta RJ, Chen KY. Technical Validation of the ActiGraph wGT3X-BT, GT9X, and Insight Watch Accelerometers. Poster Presentation (Virtual). International Conference on Ambulatory Monitoring of Physical Activity and Movement (ICAMPAM). June 2021.
21. Bevier W, **LaMunio S**, Roach M, Glantz N, Larez A, Chen K, Kerr D. Patterns of Physical Activity and Cardiometabolic Risk in Hispanic/Latino Adults. Poster Presentation. American Diabetes Association Annual Meeting. June 2022.
22. **LaMunio SR**, Brychta RJ, Chen KY. “Wear Fatigue” Does accelerometer wear compliance wane over a free-living assessment period? International Conference on Ambulatory Monitoring of Physical Activity and Movement (ICAMPAM), Keystone, CO, June 2022.
23. **LaMunio SR**, Nguyen J, Brychta RJ, Troiano RP, Friedl KE, Chen KY. Comparing ActiGraph CentrePoint Insight Watch, GT9X Link, and wGT3X-BT accelerometers to NHANES 2011-2014 GT3X+ devices using an orbital shaker. International Conference on Ambulatory Monitoring of Physical Activity and Movement (ICAMPAM), Keystone, CO, June 2022.
24. **LaMunio SR**, Hossain MB, Sazonov ES, Crouter SE. Comparison of a Head-Worn Accelerometer to a Hip-Worn ActiGraph GT9X for Classifying Activity Type and Estimating Energy Expenditure. International Conference on Ambulatory Monitoring of Physical Activity and Movement (ICAMPAM), Keystone, CO, June 2022.
25. Hukka MK, **LaMunio SR**, Hibbing PR, Crouter SE. Changing Criterion Measure Affects the Validity of Accelerometer-Based Estimates of Youth Sedentary Time. International Conference on Ambulatory Monitoring of Physical Activity and Movement (ICAMPAM), Keystone, CO, June 2022.

Regional/State Abstracts and/or Presentations

1. Celec AN, **LaMunion SR**, Parr BB. Accuracy of the Azumio Instant Heart Rate App for Measuring Resting and Exercise Heart Rate. Poster Presentation: Southeast American College of Sports Medicine Annual Meeting (SEACSM), Greenville, SC. February 2014 (Conference Cancelled).
2. **LaMunion SR**, Celec AN, Burr SD, Parr BB, McLaughlin JE. Accuracy of the Azumio Instant Heart Rate App for Measuring Resting and Exercise Heart Rate. Poster Presentation: University of South Carolina Research Discovery Day, Columbia, SC. April 2014.
3. **LaMunion SR**, Bassett DR, Crouter SE. Effects of Changing ActiGraph Bandpass Filter Width for Detecting Walking and Running. Slide Presentation: Southeast American College of Sports Medicine Annual Meeting (SEACSM), Greenville, SC. February 2016.
4. **LaMunion SR**, Toth LP, Bassett DR, Crouter SE. Effect of Wear Location on ActiGraph Activity Counts. Poster Presentation: Southeast American College of Sports Medicine Annual Meeting (SEACSM), Greenville, SC. February 2017.
5. **LaMunion SR**, Hibbing PR, Kaplan AS, Bassett DR, Crouter SE. Predicting Energy Expenditure with the ActiGraph GT9X IMU using Artificial Neural Networks. Poster Presentation: Southeast American College of Sports Medicine Annual Meeting (SEACSM), Chattanooga, TN. February 2018.
6. Kaplan AS, **LaMunion SR**, Hibbing PR, Bassett DR, Crouter SE. Activity Classification with the ActiGraph GT9X using Artificial Neural Networks. Poster Presentation: Southeast American College of Sports Medicine Annual Meeting (SEACSM), Chattanooga, TN. February 2018.
7. Kaplan AS, **LaMunion SR**, Hibbing PR, Bassett DR, Crouter SE. Development of Two-Regression Models to Predict Energy Expenditure using a Wrist-Worn GENEActiv Activity Monitor in Youth. Midwest American College of Sports Medicine Annual Meeting (MWACSM), Grand Rapids, MI. November 2018.
8. **LaMunion SR** and Crouter SE. Identification of Non-wear using a Hip-Worn ActiGraph GT9X. Southeast American College of Sports Medicine Annual Meeting (SEACSM), Greenville, SC. February 2019.
9. Clendenin BJ, Hibbing PR, **LaMunion SR**, Crouter SE. Criterion Validity of ActiGraph GT9X Step Predictions in Youth. Southeast American College of Sports Medicine Annual Meeting (SEACSM), Greenville, SC. February 2019.
10. **LaMunion SR**, Crouter SE, Broskey NT, Altazan AD, Redman LM. Classification of wGT3X-BT Non-Wear in Infants. Poster Presentation. Southeast American College of Sports Medicine Annual Meeting (SEACSM), Jacksonville, FL. February 2020.
11. Hukka MK, **LaMunion SR**, Hibbing PR, Crouter SE. Generational Differences of Consumer Wearable Devices for Estimating Physical Activity Outcomes. Thematic Poster Presentation. Southeast American College of Sports Medicine Annual Meeting (SEACSM), Jacksonville, FL. February 2020.

MENTORING

Applied Physiology Lab at the University of Tennessee, Knoxville – Dr. Scott Crouter Lab Group

- Andrew Blythe – 2017-2018, lab assistant, now physician assistant at Watauga Orthopedics
- B. Jesse Clendenin – 2017-2019, lab assistant, now medical student at Lincoln Memorial University
- Polina Krassovskaia – 2018-2019, lab assistant, now graduate student at East Carolina University
- Marisa Varrone – 2018-2020, lab assistant, now medical student at Lincoln Memorial University
- Brice Walkowski – 2018-2020, lab assistant, now nursing technician at University of Tennessee Medical Center

National Institute of Diabetes, Digestion, and Kidney Diseases Metabolic Clinical Research Unit at the National Institutes of Health – Dr. Kong Chen Lab Group

- Taylor Lentz – 2020-2022, postbaccalaureate fellow, now medical student at the University of Cincinnati
- Reed Thomas – 2021-present, postbaccalaureate fellow

MEMBERSHIP, SERVICE, & PROFESSIONAL DEVELOPMENT

Membership:

- American College of Sports Medicine (ACSM): 2014 - Current
- Southeast American College of Sports Medicine (SEACSM): 2013 - 2020
- International Society for the Measurement of Physical Behavior (ISMPB): 2017 - Current
- The Digital Medicine Society (DiME): 2021 - Current

Service:

- Southeast American College of Sports Medicine
 - Regional Meeting
 - Audio Visual Support Volunteer – Greenville, SC (2013)
 - Audio Visual Support Volunteer – Jacksonville, FL (2015)
 - Abstract Reviewer – Chattanooga, TN (2018)
 - Student Bowl Volunteer – Chattanooga, TN (2018)
 - Audio Visual Support Volunteer – Greenville, SC (2019)
 - Abstract Reviewer – Greenville, SC (2019)
- National American College of Sports Medicine
 - Annual Meeting
 - Attendance Tracking and Logistics - Boston, MA (2016)
 - Registration and Check-in – Minneapolis, MN (2018)
- Peer-Reviewer
 - Medicine and Science in Sports and Exercise (MSSE)
 - Journal for the Measurement of Physical Behaviour (JMPB)
 - PLoS One