PAUL R. HIBBING, Ph.D.

Assistant Professor University of Illinois Chicago Department of Kinesiology and Nutrition

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EDUCATION

Doctor of Philosophy (May 2020)

University of Tennessee, Knoxville

Major: Kinesiology and Sport Studies

Specialization: Exercise Physiology

Cognate: Statistics

Dissertation: Calibration and validation of gyroscope inclusive youth Sojourn models

Committee: Scott E. Crouter (Major Professor)

David R. Bassett Jr.

Dawn P. Coe Haileab Hilafu

Master of Science (August 2016)

Iowa State University

Major: Kinesiology

Thesis: Estimation of physical activity intensity using triaxial ActiGraph accelerometers in

youth populations: Impact of data type, attachment site, and modeling approach,

including adaptations of the Sojourn method for varied use in youth

Committee: Gregory J. Welk (Major Professor)

Laura D. Ellingson Philip M. Dixon

Bachelor of Science (August 2014)

Iowa State University

Major: Kinesiology and Health

Minors: German Language

Music Technology

ACADEMIC APPOINTMENTS

•	Assistant Professor	present
	University of Illinois at Chicago	
	Department of Kinesiology and Nutrition	

PROFESSIONAL EXPERIENCE

Postdoctoral Training

Fee-for-Service Research Consultancies

Graduate Research Assistantships

Other Research Positions	
 Undergraduate Research Assistant	4
Summer Research Intern	4
Research Mentorship	
High School Students (STAR 2.0)	
Lauryn Birmingham, Park Hill High School	2
Aniya Byrd, Lincoln College Preparatory Academy	
Tumusifu Ndagijimana, J.C. Harmon High School	
Sara Sadeghi, Sumner Academy of Arts and Sciences	
Nedra Seigfreid, Truman High School	2
<u>Undergraduate Students</u>	
Darby Flatley, Iowa State University	
Ayla Heder, Iowa State University	
Bailie Kies, Iowa State University	
B. Jesse Clendenin, University of Tennessee, Knoxville 2017-201	
Brice Walkowski, University of Tennessee, Knoxville	
Christine locagi, Children's Mercy Kansas City	1
Teaching Positions (● undergraduate courses ○ graduate courses)	
Undergraduate Teaching Assistant (Iowa State University)	
BIOL 255L, Laboratory Section: Human Anatomy	3
Graduate Teaching Assistant (University of Tennessee, Knoxville)	
• KNS 414, Laboratory Section: Fitness Testing and Exercise Prescription	7
o KNS 532, Laboratory Section: Exercise Physiology	9
o SOWK 665, Advanced Quantitative Research Methods	8
Guest Lecturer (University of Tennessee, Knoxville)	
• "Current Research in the Applied Physiology Laboratory"	7
• "Physical Activity and Wellness"	7
• "Cardiovascular Physiology I"	7
KNS 532, Exercise Physiology	/
III to 552, Emerciae I hydrotogy	

0	"Cardiovascular Physiology II"
	KNS 532, Exercise Physiology
•	"Assessing Energy Expenditure in Youth"
•	"Measuring Physical Activity in Youth"

GRANT FUNDING

Current Research Support

Role: Key Personnel (Principal Investigator: Shook)

Title: Fitbit Teens: A measurement error approach to estimating energy balance in free-

living adolescents

Details: The goal of this study is to advance the assessment of energy balance in youth

through measurement error modeling. I will assist in managing and processing data

from wearable activity monitors.

Amount: \$50,000

Role: Consultant (Principal Investigators: Crouter and Ding)

Title: Use of accelerometer and gyroscope data to improve precision of estimates of

physical activity type and energy expenditure in free-living adults

Details: The goal of this study is to pair multi-sensor physical activity monitoring with

advanced machine learning to improve the precision of physical activity estimates. In

response to PA-18-856: Diet and Physical Activity Assessment Methodology.

Amount: \$2.591.294

Role: Co-Investigator (Principal Investigators: Tussing-Humphreys and Varady)

Title: Effects of Time-restricted Eating versus Daily Continuous Calorie Restriction on

Body Weight and Colorectal Cancer Risk Markers among Adults with Obesity

Details: The goal of this study is to determine the comparative impacts of time restricted

eating versus caloric restriction on weight- and cancer-related variables in a 12-month randomized trial. In response to RFA-CA-20-004: Research Answers to National Cancer Institute's (NCI) Provocative Questions (R01 Clinical Trial

Optional).

Amount: \$5,083,338

Completed Awards

Role: Co-lead mentor with Carlson

Details: The purpose of the Summer Training in Academic Research (STAR) 2.0 program is

to provide high school students from underrepresented backgrounds with a mentored research training experience during a six-week summer program, culminating in manuscript submission for peer review. Our project was focused on validating estimates of total sleep and sleep stages from a Garmin Vivofit 4 device against gold standard polysomnography collected during overnight sleep studies in the Children's

Mercy Sleep Clinic.

Amount: \$2,000

Applications Under Review

Role: Co-Investigator (Principal Investigators: Carlson and Natarajan)

Title: Advancing field-based sleep measurement from 24-hour activity monitors

Details: The goal of this study is to leverage data from the thigh-worn activPAL monitor to

improve sleep assessment in the context of 24-hour epidemiology.

Role: Principal Investigator

Title: Calibration and validation of photoplethysmography data from a research-grade

smartwatch device

Details: The goal of this study is to test and apply data from a new smartwatch device

available from Empatica Inc.

Applications Not Funded

Role: Co-Investigator (Principal Investigator: Carlson)

Title: Scaling up Ecological Video Identification of Physical Activity (EVIP) for

community-based research

Details: The goal of this study is to advance computer vision approaches for providing

automated ecological physical activity assessment in parks, schools, and sports facilities. In response to PA-18-856: Diet and Physical Activity Assessment

Methodology.

Role: Co-Investigator (Principal Investigators: Shook and Creasy)

Title: Fitbit Teens: A novel estimation of energy balance through the calibration of

consumer devices in free-living adolescents

Details: The goal of this pilot study was to advance the assessment of energy balance in youth

through the use of measurement error modeling. In response to a collaborative pilot

program of Children's Mercy Kansas	City and	the Colorado	Nutrition	and	Obesity
Research Center.					

Role: Key personnel (Principal Investigator: Shook) Title: A measurement error approach to estimating energy balance in free-living adults **Details:** The goal of this study was to use measurement error modeling to improve utility of smart scales and smart watches for assessing energy intake via the intake balance method. In response to PA-18-857: Diet and Physical Activity Assessment Methodology. Role: Consultant (Principal Investigator: Welk) Title: Measurement error modeling to enhance calibration of the youth activity profile **Details:** The goal of this study was to refine the utility of the Youth Activity Profile for national applications and surveillance. In response to PA-18-856: Diet and Physical Activity Assessment Methodology. Role: Principal Investigator/Trainee Title: Occupational and non-occupational physical activity have differential associations with cardiovascular disease versus diabetes in the Hispanic Community Health Study/Study of Latinos (HCHS/SOL) **Details:** The goal of this project was to provide me training and experience related to research in the area of population health, specifically prevention of cardiovascular and cardiometabolic disease in an at-risk and underrepresented population. In response to an internal RFA at the University of Kansas Medical Center, as part of the Frontiers Clinical and Translational Science Institute programming (UL1TR002366). Role: Principal Investigator Title: Occupational and non-occupational physical activity have differential associations with cardiovascular versus glycemic biomarkers in the Hispanic Community Health Study/Study of Latinos (HCHS/SOL) **Details:** The goal of this project is to provide me training and experience related to research in the area of physical activity epidemiology, specifically related to occupational physical activity and cardiovascular/glycemic health in an at-risk and underrepresented population. In response to PA-21-048: Ruth L. Kirschstein National Research Service Award (NRSA) Individual Postdoctoral Fellowship (Parent F32). Role: Principal Investigator Title: Development of Gyroscope-Inclusive Gait Assessment Models for Patients with Multiple Sclerosis **Details:** The purpose of the Digital Endpoint Accelerator Research (DEAR) Grant was to "[support] projects that aim to validate the use of [digital health technology] data as outcome measures in clinical populations where the validation from healthy populations might not apply". The proposed study would do so with a focus on the

utility of gyroscope data for predicting gait parameters in a sample of patients with multiple sclerosis.

SCHOLARLY WORKS

Peer-Reviewed Publications

- 1. **Hibbing P**, Kim Y, Saint-Maurice PF, & Welk GJ. (2016) Impact of activity outcome and measurement instrument on estimates of youth compliance with physical activity guidelines: A cross-sectional study. *BMC Public Health*. 16(223). doi: 10.1186/s1289-016-2901-8.
- 2. Stegemöller EL, Radig H, **Hibbing P**, Wingate J, & Sapienza C. (2017) Effects of singing on voice, respiratory control, and quality of life in persons with Parkinson's Disease. *Disability and Rehabilitation*. 39(6), 594-600. doi: 10.3109/09638288.2016.1152610.
- 3. Stegemöller EL, **Hibbing P**, Radig H, & Wingate J. (2017) Therapeutic singing as an early intervention strategy for swallowing in persons with Parkinson's Disease. *Complementary Therapies in Medicine*. 31, 127-133. doi: 10.1016/j.ctim.2017.03.002.
- 4. Ellingson L, **Hibbing P**, Kim Y, Frey-Law L, Saint-Maurice P, & Welk G. (2017) Lab-based validation of different data processing methods for wrist-worn ActiGraph accelerometers in adults. *Physiological Measurement*. 38(6), 1045-1060. doi: 10.1088/1361-6579/aa6d00.
 - *Selected as a Highlight of 2017 by *Physiological Measurement*. See http://iopscience.iop.org/journal/0967-3334/page/Highlights of 2017.
- 5. Kim Y, **Hibbing P**, Saint-Maurice PF, Ellingson LD, Hennessy E, Wolff-Hughes DL, Perna FM, & Welk GJ. (2017) Surveillance of youth physical activity and sedentary behavior with wrist accelerometry. *American Journal of Preventative Medicine*. 52(6), 872-879. doi: 10.1016/j.amepre.2017.01.012.
- 6. Saint-Maurice PF, Kim Y, **Hibbing P**, Oh A, Perna FM, & Welk GJ. (2017) Calibration and validation of the Youth Activity Profile: The FLASHE study. *American Journal of Preventative Medicine*. 52(6), 880-887. doi: 10.1016/j.amepre.2016.12.010.
- 7. Bai Y, **Hibbing P**, Mantis K, & Welk GJ. (2018) Comparative evaluation of heart rate-based monitors: Apple Watch vs Fitbit Charge HR. *Journal of Sports Sciences*. 36(15), 1734-1741. doi: 10.1080/02640414.2017.1412235.
- 8. Dixon PM, Saint-Maurice PF, Kim Y, **Hibbing P**, Bai Y, & Welk GJ. (2018) A primer on the use of equivalence testing for evaluating measurement agreement. *Medicine and Science in Sports and Exercise*. 50(4), 837-845. doi: 10.1249/MSS.000000000001481.
- 9. **Hibbing PR**, Ellingson LD, Dixon PM, & Welk GJ. (2018) Adapted Sojourn models to estimate activity intensity in youth: A suite of tools. *Medicine and Science in Sports and Exercise*. 50(4), 846-854. doi: 10.1249/MSS.000000000001486.
- 10. **Hibbing PR**, LaMunion SR, Kaplan AS, & Crouter SE. (2018) Estimating energy expenditure with ActiGraph GT9X inertial measurement unit. *Medicine and Science in Sports and Exercise*. 50(5), 1093-1102. doi: 10.1249/MSS.000000000001532.

- 11. Stegemöller EL, Tatz JR, Warnecke A, **Hibbing P**, Bates B, & Zaman A. (2018) Influence of music style and rate on repetitive finger tapping. *Motor Control*. 22(4), 472-485. doi: 10.1123/mc.2017-0081.
- 12. Toth LP, Park S, Pittman WL, Sarisaltik D, **Hibbing PR**, Morton A, Springer CM, Crouter SE, & Bassett DR. (2018) Validity of activity tracker step counts during walking, running, and activities of daily living. *Translational Journal of the American College of Sports Medicine*. 3(7), 52-59. doi: 10.1249/TJX.0000000000000057.
- 13. Stegemöller EL, Izbicki P, & **Hibbing P** (2018). The influence of moving with music on motor cortical activity. *Neuroscience Letters*. 683, 27-32. doi: 10.1016/j.neulet.2018.06.030.
- 14. Gharghabi S, Yeh CM, Ding Y, Ding W, **Hibbing P**, LaMunion S, Kaplan A, Crouter SE, & Keogh E. (2018) Domain agnostic online semantic segmentation for multi-dimensional time series. *Data Mining and Knowledge Discovery*. 33(1), 96-130. doi: 10.1007/s10618-018-0589-3.
- 15. Crouter SE, **Hibbing PR**, & LaMunion SR. (2018) Use of objective measures to estimate sedentary time in youth. *Journal for the Measurement of Physical Behaviour*. 1(3), 136-142. doi: 10.1123/jmpb.2018-0007.
- Toth LP, Park S, Pittman WL, Sarisaltik D, Hibbing PR, Morton AL, Springer CM, Crouter SE, & Bassett DR. (2019) Effects of brief intermittent walking bouts on step count accuracy of wearable devices. *Journal for the Measurement of Physical Behaviour*. 2(1), 13-21. doi: 10.1123/jmpb.2018-0050.
- 17. Noonan RJ, Christian D, Boddy LM, Saint-Maurice PF, Welk GJ, **Hibbing PR**, & Fairclough SJ. (2019) Accelerometer and self-reported measures of sedentary behaviour and associations with adiposity in UK youth. *Journal of Sports Sciences*. 37(16), 1919-1925. doi: 10.1080/02640414.2019.1605649.
- 18. Park S, Toth LP, **Hibbing PR**, Springer CM, Kaplan AS, Feyerabend MD, Crouter SE, & Bassett DR. (2019) Dominant vs non-dominant wrist placement of activity monitors: Impact on steps per day. *Journal for the Measurement of Physical Behaviour*. 2(2), 118-123. doi: 10.1123/jmpb.2018-0060.
- 19. Fairclough SJ, Christian DL, Saint-Maurice PF, **Hibbing PR**, Noonan RJ, Welk GJ, Dixon P, & Boddy LM. (2019) Calibration and validation of the Youth Activity Profile as a physical activity and sedentary behaviour surveillance tool for English youth. *International Journal of Environmental Research and Public Health*. 16(19). doi: 10.3390/ijerph16193711.
- 20. Ellingson L, **Hibbing PR**, Welk GJ, Dailey D, Rakel B, Crofford LJ, Sluka KA, & Frey-Law LA. (2019) Choice of processing method for wrist-worn accelerometers influences interpretation of free-living physical activity data in a clinical sample. *Journal for the Measurement of Physical Behaviour*. 2(4), 228-236. doi: 10.1123/jmpb.2018-0062.
- 21. Crouter SE, LaMunion SR, **Hibbing PR**, Kaplan AS, & Bassett DR. (2019) Accuracy of the Cosmed K5 portable calorimeter. *PLoS ONE*. 14(12). doi: 10.1371/journal.pone.0226290.
- 22. LaMunion SR, Blythe AL, **Hibbing PR**, Kaplan AS, Clendenin BJ, & Crouter SE. (2020) Use of consumer monitors for estimating energy expenditure in youth. *Applied Physiology, Nutrition, and Metabolism*. 45(2), 161-168. doi: 10.1139/apnm-2019-0129.
- 23. Ehrlich SF, Casteel AJ, Crouter SE, **Hibbing PR**, Hedderson MM, Brown SD, Galarce M, Coe D, Bassett D, & Ferrara A. (2020) Alternative wear-time estimation methods compared to traditional diary logs for wrist-worn ActiGraph accelerometers in pregnant women. *Journal for the Measurement of Physical Behaviour*. 3(2), 110-117. doi: 10.1123/jmpb.2019-0049.

- 24. **Hibbing PR**, Bassett DR, Coe DP, LaMunion SR, & Crouter SE. (2020) Youth metabolic equivalents differ depending on operational definitions. *Medicine and Science in Sports and Exercise*. 52(8), 1846-1853. doi: 10.1249/MSS.000000000002299.
- 25. **Hibbing PR**, Bassett DR, & Crouter SE. (2020) Modifying accelerometer cut-points affects criterion validity in simulated free-living for adolescents and adults. *Research Quarterly for Exercise and Sport*. 91(3), 514-524. doi: 10.1080/02701367.2019.1688227.
- 26. **Hibbing PR**, LaMunion SR, Hilafu H, & Crouter SE. (2020) Evaluating the performance of sensor-based bout detection algorithms: The transition pairing method. *Journal for the Measurement of Physical Behaviour*. 3(3), 219-227. doi: 10.1123/jmpb.2019-0039.
- 27. Bruce JM, Cozart JS, Shook RP, Ruppen SP, Siengsukon C, Simon S, Befort C, Lynch S, Mahmoud R, Drees B, Norouzinia AN, Bradish T, Posson P, **Hibbing PR**, & Bruce AS. (2021) Modifying diet and exercise in MS (MoDEMS): Study design and protocol for a telehealth weight loss intervention for adults with obesity & multiple sclerosis. *Contemporary Clinical Trials*. 107(106495). doi: 10.1016/j.cct.2021.106495.
- 28. Stegemöller EL, Ferguson T, Zaman A, **Hibbing P**, Izbicki P, & Krigolson O. (2021) Finger tapping to different styles of music and changes in cortical oscillations. *Brain and Behavior*. 11(9), e2324. doi: 10.1002/brb3.2324.
- 29. **Hibbing PR**, Lamoureux NR, Matthews CE, & Welk GJ. (2021) Protocol and data description: The free-living activity study for health. *Journal for the Measurement of Physical Behaviour*. 4(3), 197-204. doi: 10.1123/jmpb.2020-0052.
- 30. Welk GJ, Saint-Maurice PF, Dixon PM, **Hibbing PR**, Bai Y, & McLoughlin GM. (2021) Calibration of the online youth activity profile assessment for school-based applications. *Journal for the Measurement of Physical Behaviour*. 4(3), 236-246. doi: 10.1123/jmpb.2020-0048.
- 31. Forseth B, Ortega A, **Hibbing PR**, Moon M, Steel C, Singh M, Kollu A, Miller B, Miller M, Staggs V, Calvert H, Davis AM, & Carlson JA. (2021) Adding family digital supports to classroom-based physical activity interventions to target in- and out-of-school activity: An evaluation of the Stay Active intervention during the COVID-19 pandemic. *Journal of Healthy Eating and Active Living*. 1(4), 214-228. doi: 10.51250/jheal.v1i4.31.
- 32. Steel C, Crist K, Grimes A, Bejarano C, Ortega A, **Hibbing PR**, Schipperijn J, & Carlson JA. (2021) Validity of a GPS-based algorithm and consumer wearables for classifying active trips in children and adults. *Journal for the Measurement of Physical Behaviour*. 4(4), 321-332. doi: 10.1123/jmpb.2021-0019.
- 34. Creasy SA, **Hibbing PR**, Cotton E, Lyden K, Ostendorf DM, Willis EA, Pan Z, Melanson EL, & Catenacci VA. (2021) Temporal patterns of physical activity in successful weight loss maintainers. *International Journal of Obesity*. 45(9), 2074-2082. doi: 10.1038/s41366-021-00877-4.
- 35. **Hibbing PR**, Bellettiere J, & Carlson JA. (2022) Sedentary profiles: A new perspective on accumulation patterns in sedentary behavior. *Medicine and Science in Sports and Exercise*. 54(4), 696-706. doi: 10.1249/MSS.0000000000002830.

- 36. Lamoureux NR, **Hibbing PR**, Matthews CE, & Welk GJ. (2022) Integration of report-based methods to enhance the interpretation of monitor-based research: Results from the FLASH Project. *Journal for the Measurement of Physical Behaviour*. 5(1), 42-48. doi: 10.1123/jmpb.2021-0029.
- 37. Carlson JA, Ridgers ND, Nakandala S, Zablocki R, Tuz-Zahra F, Bellettiere J, **Hibbing PR**, Steel C, Jankowska MM, Rosenberg DE, Greenwood-Hickman MA, Zou J, LaCroix AZ, Kumar A, & Natarajan L. (2022) CHAP-child: An open source method for estimating sit-to-stand transitions and sitting bout patterns from hip accelerometers among children. *International Journal of Behavioral Nutrition and Physical Activity*. 19(109). doi: 10.1186/s12966-022-01349-2.
- 38. Bellettiere J, Carlson JA, Di C, Dillon L, Dunstan D, Greenwood-Hickman MA, Healy GN, **Hibbing PR**, Jankowska MM, Kumar A, LaCroix AZ, Nakandala S, Owen N, Ridgers ND, Rosenberg D, Tuz-Zahra F, Winkler E, Zou J, & Natarajan L. (2022) CHAP-Adult: A Reliable and Valid Algorithm to Classify Sitting and Measure Sitting Patterns Using Data from Hip-Worn Accelerometers in Adults Aged 35+. *Journal for the Measurement of Physical Behaviour*. 5(4), 215-223. doi: 10.1123/jmpb.2021-0062.
- 39. **Hibbing PR**, Creasy SA, & Carlson JA. (2022) CRIB: A novel method for device-based physical behavior analysis. *Journal for the Measurement of Physical Behaviour*. 5(4), 277-287. doi: 10.1123/jmpb.2021-0059.
- 40. **Hibbing PR**, Shook RP, Panda S, Manoogian ENC, Mashek DG, & Chow LS. (2022) Predicting energy intake with an accelerometer-based intake-balance method. *British Journal of Nutrition* [advance online publication]. doi: 10.1017/S0007114522003312.
- 41. Ortega A, Forseth B, **Hibbing PR**, Steel C, & Carlson JA. (2023) Convergent validity between epoch-based activPAL and ActiGraph methods for measuring moderate-to-vigorous physical activity in youth and adults. *Journal for the Measurement of Physical Behaviour* [advance online publication]. doi: 10.1123/jmpb.2022-0013.

Manuscripts in Review

- 1. Carlson JA, **Hibbing PR**, Forseth B, Diaz K, Sotres-Alvarez D, Bejarano C, Duran A, Castaneda S, Garcia M, Perreira KM, Daviglus M, Van Horn L, Gellman MD, Isasi CR, Cai J, Delamater AM, Staggs V, Thyfault J, & Gallo LC. (in Review) Sedentary bout patterns and metabolic health in the Hispanic Community Health Study/Study of Latinos (HCHS/SOL) Youth. *Journal of the American Heart Association*.
- 2. **Hibbing PR**, Birmingham L, Byrd A, Ndagijimana T, Sadeghi S, Seigfreid N, Farr D, Pilla M, Al-Shawwa B, Ingram DG, & Carlson JA. (in Review) Validity of the Garmin Vivofit 4 for assessing sleep in youth experiencing sleep disturbances. *Journal for the Measurement of Physical Behaviour*.
- 3. Bai Y, Saint-Maurice PF, McLoughlin GM, **Hibbing PR**, & Welk GJ. (in Review) The measurement reliability and equivalence of print versus online versions of the Youth Activity Profile. *PLoS ONE*.
- 4. **Hibbing PR**, Welk GJ, Ries D, Yeh HW, & Shook RP. (in Review) Criterion validity of wrist accelerometry for assessing energy intake via the intake-balance technique. *International Journal of Behavioral Nutrition and Physical Activity*.
- 5. **Hibbing PR**, Carlson JA, Simon SL, Melanson EL, & Creasy SA. (in Review) Convergent validity of time in bed estimates from activPAL and Actiwatch in free-living youth and adults. *Journal for the Measurement of Physical Behaviour*.

Non-Peer-Reviewed Publications

- 1. Welk GJ, Saint-Maurice PF, Kim Y, Ellingson E, **Hibbing P**, Wolff-Hughes D, & Perna FM. (2017) Understanding and interpreting error in physical activity data: Insights from the FLASHE study. *American Journal of Preventative Medicine*. 52(6), 836-838.
- 2. **Hibbing P**, LaMunion S, & Toth L. (2017) Fitness trackers can be fashionable and functional. *ACSM Fit Society Page*. 19(3):3-4.
- 3. Physical Activity Alliance. *The 2022 United States Report Card on Physical Activity for Children and Youth*. Full report and executive summary available at https://paamovewithus.org/news/2022-u-s-report-on-physical-activity-for-children-and-youth/.

Manuscripts in Preparation

- 1. **Hibbing PR**, Carlson JA, Steel C, Greenwood-Hickman MA, Nakandala S, Jankowska MM, Rosenberg D, Tuz-Zahra F, Bellettiere J, Zou J, LaCroix AZ, Kumar A, Katzmarzyk PT, & Natarajan L. Deep-learned sitting patterns and obesity in the International Study of Childhood Obesity, Lifestyle and the Environment (ISCOLE). Target journal: TBD.
- 2. Jankowska MM, Tribby CP, **Hibbing PR**, Carlson JA, Greenwood-Hickman MA, Sears DD, LaCroix AZ, & Natarajan L. A comparison of the CHAP versus cut point method for measuring accelerometry derived sitting patterns as associated with metabolic syndrome in adults. Target journal: TBD.
- 3. LaMunion SR, **Hibbing PR**, Ding W, Keogh E, & Crouter SE. Protocol and methods for the Free-Living Physical Activity in Youth (FLPAY) study. Target journal: TBD.
- 4. **Hibbing PR**, LaMunion SR, Bassett DR, Coe DP, Hilafu H, Walkowski B, & Crouter SE. Do sensor fusion and change point detection improve device-based predictions of physical activity intensity in youth? Target journal: *Medicine and Science in Sports and Exercise*.
- 5. Zablocki RW, Hartman S, Di C, Zou J, Carlson JA, **Hibbing PR**, Rosenberg DE, Greenwood-Hickman MA, Dillon L, LaCroix AZ, & Natarajan L. Using functional principal component analysis (FPCA) to quantify sitting patterns derived from wearable sensors. Target journal: *Statistics in Medicine*.
- 6. Bruce JM, Cozart JS, Shook RP, Befort C, Siengsukon C, Simon S, Lynch SG, Mahmoud R, Drees B, Posson P, **Hibbing PR**, Huebner J, Bradish T, Robichaud J, & Bruce AS. Modifying Diet and Exercise in Multiple Sclerosis (MoDEMS): A randomized controlled trial examining a behavioral weight loss intervention for adults with obesity and MS. Target journal: *Multiple Sclerosis Journal*.

Book Chapters in Preparation

1. Crouter SE, **Hibbing PR**, & LaMunion SR. Physical activity assessment. In: *Health Professionals Guide to Weight Management for Adults*. Academy of Nutrition and Dietetics.

National/International Abstracts and/or Presentations

1. Stegemöller EL, **Hibbing P**, Brinkman A, Tatz J, Kinedinst B, & Frick P. (2015) The influence of activating versus relaxing music on repetitive finger movement and associated motor cortical activity. Poster presented at the Society for Neuroscience 45th annual meeting, Chicago, IL.

- 2. Stegemöller EL, **Hibbing P**, & Radig H. (2015) Effects of singing on speech and swallow in patients with Parkinson's disease. Poster presented at the Movement Disorders Society 19th annual meeting, San Diego, CA.
- 3. **Hibbing PR**, Kim Y, Saint-Maurice PF, & Welk GJ. (2015) Activity monitor agreement in assessing compliance with Step and physical activity guidelines in youth. *Medicine and Science in Sports and Exercise*. 47(5 Suppl 1), 921. Poster presented at the American College of Sports Medicine 62nd annual meeting, San Diego, CA.
- 4. Saint-Maurice PF, **Hibbing P**, Bai Y, & Welk GJ. (2016) Agreement between print and online versions of the Youth Activity Profile. *Medicine and Science in Sports and Exercise*. 48(5 Suppl 1), 313. Slides presented at the American College of Sports Medicine 63rd annual meeting, Boston, MA.
- 5. Kim Y, Hibbing P, Ellingson LD, Saint-Maurice PF, Hennessy E, McClain J, & Welk GJ. (2016) Comparison of outcomes between raw acceleration and counts-based methods for processing wrist-worn accelerometers: the FLASHE study. *Medicine and Science in Sports and Exercise*. 48(5 Suppl 1), 812. Slides presented at the American College of Sports Medicine 63rd annual meeting, Boston, MA.
- 6. **Hibbing P**, Ellingson L, Dixon P, & Welk G. (2017) Estimating physical activity intensity in youth with accelerometers: A flexible suite of tools. *Medicine and Science in Sports and Exercise*. 49(5 Suppl 1), 475. Poster presented at the American College of Sports Medicine 64th annual meeting, Denver, CO.
- 7. Bai Y, Welk G, **Hibbing P**, & Mantis K. (2017) Which heart rate-based monitor is better: Apple Watch or Fitbit Charge HR? Slides presented at the 5th International Conference on Ambulatory Monitoring of Physical Activity and Movement, Bethesda, MD.
- 8. Toth L, **Hibbing P**, Park S, Morton A, Pittman W, Sarisaltik D, Kaplan A, Crouter S, & Bassett D. (2017) Criterion validity of consumer and research grade activity monitors during brief, intermittent walking. Slides presented at the 5th International Conference on Ambulatory Monitoring of Physical Activity and Movement, Bethesda, MD.
- 9. **Hibbing P**, LaMunion S, Bassett D, & Crouter S. (2017) Impact of inertial measurement unit on activity recognition using ActiGraph GT9X. Poster presented at the 5th International Conference on Ambulatory Monitoring of Physical Activity and Movement, Bethesda, MD.
- 10. Kaplan A, Toth L, **Hibbing P**, Morton A, Park S, Pittman W, Sarisaltik D, Bassett D, & Crouter S. (2017) Sources of error for wearable step counters. Poster presented at the 5th International Conference on Ambulatory Monitoring of Physical Activity and Movement, Bethesda, MD.
- 11. LaMunion S, **Hibbing P**, Bassett D, & Crouter S. (2017) Application of the ActiGraph GT9X IMU to estimate energy expenditure. Slides presented at the 5th International Conference on Ambulatory Monitoring of Physical Activity and Movement, Bethesda, MD.
- 12. Crouter S, **Hibbing P**, LaMunion SR, & Bassett DR. (2017) Use of the ActiGraph GT9X IMU to predict energy expenditure. Slides presented at the 5th International Conference on Ambulatory Monitoring of Physical Activity and Movement, Bethesda, MD.
- 13. Crouter SE, LaMunion SR, **Hibbing PR**, & Bassett DR. (2017) Use of a 2-Regression Model to Estimate Energy Expenditure using the ActiGraph GT9X IMU. Poster presented at the 4th International Conference on Recent Advances and Controversies in Measuring Energy Metabolism, Fribourg, Switzerland.

- 14. LaMunion SR, **Hibbing PR**, Bassett DR, & Crouter SE. (2017) Use of the ActiGraph GT9X Inertial Measurement Unit to Predict Energy Expenditure Using Artificial Neural Networks. Slides presented at the 4th International Conference on Recent Advances and Controversies in Measuring Energy Metabolism, Fribourg, Switzerland.
- 15. Kaplan AS, LaMunion SR, **Hibbing PR**, & Crouter SE. (2018) Use of consumer monitors for estimating energy expenditure in youth. *Medicine and Science in Sports and Exercise*. 50(5 Suppl 1), 262. Slides presented at the American College of Sports Medicine 65th annual meeting, Minneapolis, MN.
- 16. LaMunion SR, Hibbing PR, Kaplan AS, & Crouter SE. (2018) Physical activity category classification using the ActiGraph GT9X in youth. *Medicine and Science in Sports and Exercise*. 50(5 Suppl 1), 295. Poster presented at the American College of Sports Medicine 65th annual meeting, Minneapolis, MN.
- 17. **Hibbing PR**, Bassett DR, & Crouter SE. (2018) Modifying accelerometer cut-points affects criterion validity in free-living youth and adults. *Medicine and Science in Sports and Exercise*. 50(5 Suppl 1), 298. Poster presented at the American College of Sports Medicine 65th annual meeting, Minneapolis, MN.
- 18. Christian D, Saint-Maurice PF, **Hibbing P**, Noonan RJ, Boddy LM, Welk GJ, & Fairclough SJ. (2018) Calibration of the UK Youth Activity Profile. *Journal of Physical Activity and Health*. 15(10), S39. Slides presented at the 7th International Society for Physical Activity and Health Congress, London, England.
- 19. Crouter SE, LaMunion SR, **Hibbing PR**, Kaplan AS, Quarantillo ME, & Bassett DR. (2019) Accuracy of the Cosmed K5 portable metabolic system. *Medicine and Science in Sports and Exercise*. 51(6 suppl 1), 147. Slides presented at the American College of Sports Medicine 66th annual meeting, Orlando, FL.
- 20. Lamoureux NR, **Hibbing PR**, Matthews CE, & Welk GJ. (2019) Temporal relationships between the Act24 and a monitor-based method for estimating energy expenditure over a 24 hour period. *Medicine and Science in Sports and Exercise*. 51(6 suppl 1), 373. Poster presented at the American College of Sports Medicine 66th annual meeting, Orlando, FL.
- 21. **Hibbing PR** & Crouter SE. (2019) Resting energy expenditure and metabolic equivalents in youth: Impact of inconsistent operational definitions. *Medicine and Science in Sports and Exercise*. 51(6 suppl 1), 818-819. Poster presented at the American College of Sports Medicine 66th annual meeting, Orlando, FL.
- 22. **Hibbing PR**, LaMunion SR, Hilafu H, & Crouter SE. (2019) Evaluating the performance of bout detection algorithms for wearable sensors: The transition pairing method. Slides presented at the 6th International Conference on Ambulatory Monitoring of Physical Activity and Movement, Maastricht, The Netherlands.
- 23. Crouter SE, Clendenin BJ, **Hibbing PR**, & LaMunion SR. (2019) Validity of consumer monitors for estimating steps in youth. Slides presented at the 6th International Conference on Ambulatory Monitoring of Physical Activity and Movement, Maastricht, The Netherlands.
- 24. Ehrlich SF, Hedderson MM, Brown SD, Crouter SE, **Hibbing PR**, Feng J, Tsai AL, & Ferrara A. (2020) Objectively measured physical activity during the first trimester and glucose tolerance at 24-28 weeks gestation. *Medicine and Science in Sports and Exercise*. 52(7S), 100. Poster accepted for the American College of Sports Medicine 67th annual meeting (cancelled due to COVID-19 pandemic).

- 25. Hukka MK, LaMunion SR, **Hibbing PR**, & Crouter SE. (2020) Generational differences of consumer wearable devices for estimating physical activity outcomes. *Medicine and Science in Sports and Exercise*. 52(7S), 519. Rapid fire poster accepted for the American College of Sports Medicine 67th annual meeting (cancelled due to COVID-19 pandemic).
- 26. **Hibbing PR** & Crouter SE. (2020) Dynamic segmentation of youth accelerometer data by Sojourn and change point detection methods. *Medicine and Science in Sports and Exercise*. 52(7S), 824-825. Thematic poster accepted for the American College of Sports Medicine 67th annual meeting (cancelled due to COVID-19 pandemic).
- 27. Ehrlich SF, Hedderson MM, Brown SD, Crouter SE, **Hibbing P**, Feng J, Tsai AL, & Ferrara A. (2020) Objectively measured and self-reported physical activity in the first trimester of pregnancy, glucose tolerance, and gestational diabetes in women with overweight/obesity. *Diabetes*. 69(suppl 1) 1343-P. doi: 10.2337/db20-1343-P. Poster presented at the American Diabetes Association 2020 80th Scientific Sessions (held virtually due to COVID-19 pandemic).
- 28. Forseth B, Moon M, Singh M, Steel C, Ortega A, **Hibbing P**, Miller B, Miller M, Calvert H, Davis AM, & Carlson JA. (2021). Acceptability and impact of a remote classroom- and family-based physical activity interventions during the COVID-19 pandemic. Slides presented at the Active Living Conference (held virtually due to COVID-19 pandemic) of the Physical Activity Policy Research and Evaluation Network.
- 29. **Hibbing PR**, Carlson JA, Simon SL, Melanson EL, & Creasy SA. (2021) Convergent validity of Actiwatch and activPAL for assessing time in bed. *Journal for the Measurement of Physical Behaviour*. 4(S1), S20-S21. Virtual poster presented at the 7th International Conference on Ambulatory Monitoring of Physical Activity and Movement (held virtually due to COVID-19 pandemic).
- 30. White DA, Posson PM, **Hibbing PR**, & Shook RP. (2022) Somatic maturity and resting energy expenditure to fat-free mass (ree/ffm) ratio in mid- to late-adolescence. *Medicine and Science in Sports and Exercise*. 54(9S), 583. Poster presented at the American College of Sports Medicine 69th annual meeting, San Diego, CA.
- 31. **Hibbing PR**, Welk GJ, & Shook RP. (2022) Free-living validity of energy expenditure estimates from wrist-worn ActiGraph monitors: A doubly labeled water study. *Journal for the Measurement of Physical Behaviour*. 5(4), 340. Poster presented at the 8th International Conference on Ambulatory Monitoring of Physical Activity and Movement, Keystone, CO.

Workshops/Symposia

- 1. **Hibbing PR**. (2019) Accessing and using data through the FLASH GitHub repository. Presented in the symposium *Advancing collaborative activity monitor research using open-source tools* with copresenters Greg Welk (chair) and Charles Matthews. 6th International Conference on Ambulatory Monitoring of Physical Activity and Movement, Maastricht, The Netherlands.
- 2. **Hibbing PR**. (2022) Using git and GitHub to track, disseminate, and maintain your physical behavior code and data. Workshop presented at the 8th International Conference on Ambulatory Monitoring of Physical Activity and Movement, Keystone, CO, USA.
- 3. **Hibbing PR**. (2022) Deep-learned sedentary patterns and obesity in the International Study of Childhood Obesity, Lifestyle, and Environment (ISCOLE): Results from the CHAP-child model. Presented in the symposium *The CNN Hip Accelerometer Posture (CHAP) Suite: Leveraging deep learning to close the gap between thigh and hip accelerometry in the free-living measurement of*

sitting behavior with co-presenters Loki Natarajan (chair), Mikael Anne Greenwood-Hickman, Jordan Carlson, and Marta Jankowska. *Journal for the Measurement of Physical Behaviour*. 5(4), 355. 8th International Conference on Ambulatory Monitoring of Physical Activity and Movement, Keystone, CO, USA.

Regional/Institutional Presentations

- 1. **Hibbing P** & Devick R. (2014) The validity of an online tool for the assessment of physical activity behaviors in youth. Slides presented at the 8th Symposium on Undergraduate Research and Creative Expression, Ames, IA.
- 2. **Hibbing PR**, Bassett DR, & Crouter SE. (2018) Modifying accelerometer cut-points affects criterion validity in free-living youth and adults. Poster presented at the 46th annual meeting of the Southeast Chapter of the American College of Sports Medicine, Chattanooga, TN.
- 3. LaMunion SR, **Hibbing PR**, Kaplan AS, Bassett DR, & Crouter SE. (2018) Predicting energy expenditure with the ActiGraph GT9X IMU using artificial neural networks. Poster presented at the 46th annual meeting of the Southeast Chapter of the American College of Sports Medicine, Chattanooga, TN.
- 4. Kaplan AS, LaMunion SR, **Hibbing PR**, Bassett DR, & Crouter SE. (2018) Activity classification with the ActiGraph GT9X IMU using artificial neural networks. Poster presented at the 46th annual meeting of the Southeast Chapter of the American College of Sports Medicine, Chattanooga, TN.
- 5. Park S, Toth LP, **Hibbing PR**, Springer CM, Kaplan AS, Feyerabend MD, Crouter SE, & Bassett DR. (2018) Dominant vs non-dominant wear: A comparison of steps per day. Poster presented at the 46th annual meeting of the Southeast Chapter of the American College of Sports Medicine, Chattanooga, TN.
- 6. Kaplan AS, LaMunion SR, **Hibbing PR**, Bassett DR, & Crouter SE. (2018) Use of two-regression models to predict energy expenditure using wrist-worn GENEActivs in youth. Slides presented at the 46th annual meeting of the Midwest Chapter of the American College of Sports Medicine, Grand Rapids, MI.
- 7. **Hibbing PR** & Crouter SE. (2019) Resting energy expenditure and metabolic equivalents in youth: Impact of inconsistent operational definitions. Poster presented at the 47th annual meeting of the Southeast Chapter of the American College of Sports Medicine, Greenville, SC.
- 8. Clendenin BJ, **Hibbing PR**, LaMunion SR, & Crouter SE. (2019) Criterion validity of ActiGraph GT9X step predictions in youth. Slides presented at the 47th annual meeting of the Southeast Chapter of the American College of Sports Medicine, Greenville, SC.
- 9. Hukka MK, LaMunion SR, **Hibbing PR**, & Crouter SE. (2020) Generational differences of consumer wearable devices for estimating physical activity outcomes. Thematic poster presented at the 48th annual meeting of the Southeast Chapter of the American College of Sports Medicine, Jacksonville, FL.
- 10. Rand BG, Ferrara A, Hibbing PR, Hedderson MM, Brown SD, Badon SE, Crouter SE, & Ehrlich SF. (2021) The association of physical activity with lipid levels in pregnant women with overweight and obesity. Poster presented at the 49th annual meeting of the Southeast Chapter of the American College of Sports Medicine, held online due to COVID-19 pandemic.

11. Posson P, **Hibbing PR**, & Shook R. (2021) Resting energy expenditure equations have lower validity for overweight and obese versus healthy weight adolescents. Poster presented at the 6th annual Research at Children's Mercy Month Poster Session, Kansas City, MO.

SOFTWARE PACKAGES

Comprehensive R Archive Network (CRAN)

- 1. **Paul R. Hibbing** (2018). TwoRegression: Develop and Apply Two-Regression Algorithms. R package version 1.0.0. URL: https://cran.r-project.org/package=TwoRegression.
- 2. **Paul R. Hibbing** (2018). AGread: Read Data Files from ActiGraph Monitors. R package version 1.1.1. https://cran.r-project.org/package=AGread.
 - *Note: As of September 2022, CRAN has archived this package because of "issues" (c++ memory-related) that I have not had time to fix. You can still find AGread on GitHub at https://github.com/paulhibbing/AGread.
- 3. **Paul R. Hibbing** (2018). Observation: Collect and Process Physical Activity Direct Observation Data. R package version 0.3.0. URL: https://cran.r-project.org/package=Observation.
- 4. **Paul R. Hibbing** (2019). PAutilities: Streamline physical activity research. R package version 1.1.0. URL: https://cran.r-project.org/package=PAutilities.
- 5. **Paul R. Hibbing** & Kate Lyden (2019). Sojourn.Data: Supporting Objects for Sojourn Accelerometer Methods. R package version 0.3.0. URL: https://cran.r-project.org/package=Sojourn.Data.
- 6. **Paul R. Hibbing**, Kate Lyden, & Isaac J. Schwabacher (2019). Sojourn: Apply Sojourn methods for processing ActiGraph accelerometer data. R package version 1.1.0. URL: https://cran.r-project.org/package=Sojourn.

GitHub

- 1. PAHP Lab (2020). FLASH: Free Living Activity Study for Health. R package version 0.1.1.9000. URL: https://github.com/PAHPLabResearch/FLASH. Access available by filling out the form at https://iastate.qualtrics.com/jfe/form/SV_be0mbBZOhMpeiX3.
- 2. **Paul R. Hibbing** (2022). PBpatterns: Analyze patterns of physical behavior. R package version 0.3.1.9000. URL: https://github.com/paulhibbing/PBpatterns.
- 3. **Paul R. Hibbing** (2022). daytime: Operate on time variables for physical behavior research. R package version 0.3.0.9000. URL: https://github.com/paulhibbing/daytime.
- 4. PAHP Lab (2022). ACT24: R Interface for the Activities Completed over Time in 24 Hours instrument. Under development. URL: https://github.com/PAHPLabResearch/ACT24.
- 5. **Paul R. Hibbing** (2022). anthropometry: Conveniently characterize body measures. Under development. URL: https://github.com/paulhibbing/anthropometrics.
- 6. **Paul R. Hibbing** (2022). accelEE: Predict Energy Expenditure from Accelerometer Data. Under development. URL: https://github.com/paulhibbing/accelEE.

- 7. **Paul R. Hibbing** (2022). EE.Data: Objects for predicting energy expenditure. Under development. URL: https://github.com/paulhibbing/EE.Data.
- 8. **Paul R. Hibbing** (2022). IntakeBalance: Apply intake-balance methods. Under development. URL: https://github.com/paulhibbing/IntakeBalance.

PROFESSIONAL SOCIETIES

American College of Sports Medicine	. 02/2016 – present
International Society for the Measurement of Physical Behaviour	. 03/2017 – present
International Society of Behavioral Nutrition and Physical Activity	. 06/2021 – present
American College of Sports Medicine, Southeast Regional Chapter	01/2018 - 12/2020

HONORS & AWARDS

Iowa State University

Dean's List	(College of Human Sciences, Fall '10 – Spring '14*)
Dean's Scholarship	(College of Human Sciences, '10-'11 academic year; \$1000)
Academic Recognition Award	('10-'11 academic year; \$1250)
Academic Recognition Award (Renewa	ıl)(Fall '11; \$625*)
Barbara E. Forker Leadership Award	(Department of Kinesiology, 2014)
Top 20 Graduating Senior Scholar	(Department of Kinesiology, 2014)
Graduate Magna Cum Laude	(2014)
Outstanding Master's Student Award	(Department of Kinesiology, 2016)
AKA [†] Master's Scholar Award (institut	ional winner) (Department of Kinesiology, 2016)

University of Tennessee, Knoxville

Chancellor's Fellowship	('16-'17 academic year; \$10,000)
Chancellor's Fellowship (Renewal)	('17-'18 academic year; \$10,000)
Chancellor's Fellowship (Renewal)	('18-'19 academic year; \$10,000)
Shipley-Swann Graduate Fellowship	('18-'19 academic year; \$5000)
Andy Kozar Graduate Research Scholarship Award	(KRSS [†] , 2019; \$1000)
Chancellor's Fellowship (Renewal)	('19-'20 academic year; \$10,000)
Shipley-Swann Graduate Fellowship	('19-'20 academic year; \$5000)
Extraordinary Professional Promise Citation	(CEHHS [†] , 2020)
Edward K. Capen Award	(KRSS [†] , 2020; \$200)

Andy Kozar Graduate Research Scholarship Award	$(KRSS^{\dagger}, 2020; \$1000)$
AKA [†] Doctoral Scholar Award (institutional winner)	(KRSS [†] , 2020)
Helen B. Watson Faculty/Student Award for Outstanding Doct. Dissertation	(CEHHS [†] , 2020; \$375)

*No classes taken Spring '12

SERVICE & OUTREACH

Professional Service

Postdoctoral Fellowship Program (director Amanda Bruce) Children's Mercy Kansas City/University of Kansas Medical Center Center for Children's Healthy Lifestyles & Nutrition

Editorial Activities

Manuscript Reviewer

- *Medicine and Science in Sports and Exercise* (13)
- Journal for the Measurement of Physical Behaviour (5)
- Measurement in Physical Education and Exercise Science (2)
- *Journal of Science and Medicine in Sport* (2)
- European Journal of Sport Science (1)
- Journal of Sports Sciences (1)
- Applied Physiology, Nutrition, and Metabolism (1)

Community Service

•	Bike Rodeo Assistant	10/25/2016
•	Laboratory Instructor	07/10/2018
•	Laboratory Instructor	02/19/2019
•	Volunteer Donation Sorter	07/09/2022

[†]AKA- American Kinesiology Association; KRSS- department of Kinesiology, Recreation, and Sport Studies; CEHHS- College of Education, Health, and Human Sciences