

Jamie Ann Johnston, Ph.D.

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Education

2000-2003 **Doctor of Philosophy**
The Pennsylvania State University, University Park, PA,
Specialization: Kinesiology
Focus: Motor Control/Behavioral Neuroscience

1998-2000 **Master of Science**
The Pennsylvania State University, University Park, PA
Specialization: Kinesiology
Focus: Motor Control/Behavioral Neuroscience

1989-1993 **Bachelor of Arts**
Amherst College, Amherst MA
Majors: Computer Science and Psychology

Research Training

2005-2007 **Research Associate**, The Mayo Clinic Arizona

2003-2007 **Post-Doctoral Fellow**, Arizona State University,
Kinesiology Department

1999-2001 **Research Assistant**, The Pennsylvania State University, Psychology Department

1998 - 2003 **Graduate Assistant**, The Pennsylvania State University, Kinesiology Department

Academic Positions

11/2007 - Present **Assistant Professor**, University of Calgary, Faculty of Kinesiology
Member: Biomedical Engineering Graduate Faculty
Director: Movement Neurophysiology Laboratory

2005-2007 **Adjunct Faculty**, Arizona State University, Kinesiology Department

Research Scholarship

CURRENT H-INDEX: 9

***Note: trainees in references are bolded and underlined**

Focus: Neurophysiology of human movement. Specifically, understanding motor control of the upper extremity at multiple levels of analysis (i.e., cortex-to-muscle-to-behavior) in healthy and clinical populations (e.g., Stroke and Carpal Tunnel Syndrome)

Current Projects:

- 1) Roles of visual and tactile information during grasping with changes in object center of mass (manuscript in preparation).
- 2) Effects of acute sensory deficits on grasping objects with different center of mass (manuscript in preparation)
- 3) Effects of acute sensory deficits on grasping objects of different masses (data analysis)
- 4) Effects of acute sensory deficits on grasping objects of different textures (data analysis)
- 5) Role of visual information on the ability for patients with carpal tunnel syndrome to adapt multi-digit forces to changes in object center of mass (data analysis).

- 7) Effects of local muscle vibration on corticospinal facilitation/inhibition (manuscript in preparation)
- 8) Enslavement and individuation in stroke patients (2 manuscripts in preparation)

Bibliography:

Invited Editorials:

- M1. Latash ML, Johnston JA. Why Did Grandpa Drop the Glass? *Journal of Applied Physiology*, 2012, 112 (7): 1093-1094.

Refereed Journal Articles:

- M2. Zhang W, Johnston JA, Ross M, Sanniec K, Gleason E, Dueck A, Santello M. Effects of Carpal Tunnel Syndrome on dexterous manipulation are grip type-dependent. *PLoS One*, 2013, 8(1):e53751. doi: 10.1371/journal.pone.0053751.
- M3. Zhang W, Johnston JA, Ross M, Coakley B, Gleason E, Dueck A, Santello M. Effects of Carpal Tunnel Syndrome on adaptation of multi-digit forces to object mass distribution for whole-hand manipulation. *Journal of NeuroEngineering and Rehabilitation*, 2012, 9:83 doi:10.1186/1743-0003-9-83.
- M4. **Afifi M**, Santello M, and Johnston JA. Effects of Carpal Tunnel Syndrome on adaptation of multi-digit forces to object texture. *Clinical Neurophysiology*, 2012, 123 (11): 2281-2290.
- M5. **Robertson JW**, Johnston JA. The superposition principle applied to grasping an object producing moments outside anatomically-defined axes. *Journal of Biomechanics*, 2012, 45 (9): 1580-1585.
- M6. Zhang W, Johnston JA, Ross MA, Smith AA, Coakley BJ, Gleason EA, Dueck AC, Santello M. Effects of Carpal Tunnel Syndrome on Adaptation of Multi-Digit Forces to Object Weight for Whole-Hand Manipulation. *PLoS ONE*, 2011, 6(11): e27715. doi: 10.1371/journal.pone.0027715.
- M7. Johnston JA, Formicone G, Hamm TM, Santello M. Assessment of across-muscle coherence using multi-unit vs. single unit recordings. *Experimental Brain Research*, 2010, 207(3-4): 269-282.
- M8. Johnston JA, Bobich LR, Santello M. Coordination of intrinsic and extrinsic hand muscle activity as a function of wrist joint angle during two-digit grasping. *Neuroscience Letters*, 2010, 474(2): 104-108.

- M9. McIsaac T, Santello M, Johnston J, Zhang W, Gordon A. Task-specific modulation of multi-digit forces to object texture. *Experimental Brain Research*, 2009, 194(1): 79-90.
- M10. Wings SA, Johnston JA, Santello M. Muscle-pair specific distribution and grip type modulation of neural common input to extrinsic digit flexors. *Journal of Neurophysiology*, 2006, 96(3):1258-66.
- M11. Johnston JA, Wings SA, Santello M. Periodic modulation of motor unit activity in extrinsic hand muscles during multidigit grasping. *Journal of Neurophysiology*, 2005, 94:206-218.
- M12. Johnston JA, Wings SA, Santello M. Neuromuscular determinants of force coordination during multidigit grasping. *Conf Proc IEEE Eng Med Biol Soc*, 2004, 4645-4648.
- M13. Slobounov S, Johnston J, Chiang H, Ray W. The role of sub-maximal force production in the enslaving phenomenon, *Brain Research*, 2002, 954:212-219.
- M14. Slobounov S, Johnston J, Chiang H, Rearick M, Ray W. Movement-related EEG potentials are force or end-effector dependent: evidence from a multifinger experiment, *Clinical Neurophysiology*, 2002, 113(7):1125-1135.
- M15. Slobounov S, Johnston J, Chiang H, Ray W. Motor-related cortical potentials accompanying enslaving effect in single versus combination of fingers force production tasks, *Clinical Neurophysiology*, 2002, 113(9):1444-1453.
- M16. Slobounov S, Chiang H, Johnston J, Ray W. Modulated cortical control of individual fingers in experienced musicians: an EEG study, *Clinical Neurophysiology*, 2002, 113:2013-2024.
- M17. Johnston J, Rearick M, Slobounov S. Movement-related cortical potentials associated with progressive muscle fatigue in a grasping task. *Clinical Neurophysiology*, 2001, 112:68-77.
- M18. Rearick MP, Johnston JA, Slobounov SM. Feedback-dependent modulation of isometric force control: an EEG study in visuomotor integration, *Brain Research: Cognitive Brain Research*, 2001, 12: 117-130.

- M19. Ray WJ, Slobounov S, Mordkoff JT, Johnston J, Simon RF. Rate of force development and the lateralized readiness potential. *Psychophysiology*, 2000, 37: 757-765.
- M20. Slobounov SM, Rearick MP, Simon RF, Johnston JA. Movement-related potentials are task or end-effector dependent: evidence from a multifinger experiment. *Experimental Brain Research*, 2000, 135:106-116.

Book Chapters:

- BC1. Johnston JA, Santello M (2009). Multi-digit grasping and manipulation: Effect of Carpal Tunnel Syndrome on force coordination. In: Nowak DA, Hermsdorfer J, eds. *Sensorimotor Control of Grasping: Physiology and Pathophysiology*. New York: Cambridge University Press; pp. 285-295.
- BC2. Johnston JA, Wings SA, Santello M (2009). Neural control of hand muscles during prehension. In: Sternad D, editor. *Progress in Motor Control – A Multidisciplinary Perspective*. New York: Springer; pp. 577-596.

Dissertation:

- Jamie A. Johnston. Cortical Activity Associated with Finger Tremor. Dissertation, 2003.

Refereed Abstracts:

- A1. **Mostafa Afifi**, Marco Santello, Jamie A. Johnston. The use of visual information for multi-digit force adaptation to center of mass location in patients with Carpal Tunnel Syndrome. Soc Neurosci Abstr, 2012.
- A2. Jamie A. Johnston, Sean P. Dukelow, **Michael F. Dew**. Flexion and extension enslavement patterns in male stroke patients. Soc Neurosci Abstr, 2012.
- A3. **Michael D. Lane**, Jamie A. Johnston. Effects of vibration of a muscle at varying lengths on corticospinal excitability. Soc Neurosci Abstr, 2012.
- A4. **Jason W. Robertson**, Jamie A. Johnston. The development of grip and moment control during a grasp, lift and hold task. Soc Neurosci Abstr, 2012.
- A5. Wei Zhang, Jamie A. Johnston, Mark A. Ross, Anthony A. Smith, Kyle Sanniec, Elizabeth A. Gleason, Amylou C. Dueck, Marco Santello. Effects of Carpal Tunnel Syndrome on object manipulation using a variable number of digits. Soc Neurosci Abstr, submitted 2012.

- A6. **Jason W. Robertson**, Jamie A. Johnston. The principal of superposition when grasping an object exerting two-dimensional external moments. Alberta Biomedical Engineering Conference, 2011.
- A7. **Mostafa Afifi**, Marco Santello, Jamie A. Johnston. Multi-digit force adaptation to texture in patients with Carpal Tunnel Syndrome. Soc Neurosci Abstr, 2011.
- A8. Wei Zhang, Jamie Johnston, Anthony A. Smith, Mark Ross, Brandon J. Coakley, Elizabeth A. Gleason, Amylou C. Dueck, Marco Santello. Multi-digit coordination and adaptation to object mass distribution in carpal tunnel syndrome. American Society of Biomechanics, 2011.
- A9. **Jason W. Robertson**, Sean Dukelow, Kenneth Lam, Jamie A. Johnston. A Novel Stroke Assessment Tool Measuring Individual Finger Forces and Torques. Alberta Biomedical Engineering Conference, 2010.
- A10. **Grant Cechmanek**, Jamie A. Johnston. Effects of common input on muscle force coherence: A simulation study. Alberta Biomedical Engineering Conference, 2010.
- A11. **Christie Schmidt**, Jamie A. Johnston. Force coordination during multi-digit grasping in older adults. World Congress on Biomechanics, 2010.
- A12. **Christie Schmidt**, Jamie Johnston. Coordination of multi-digit forces in older adults as a function of changes in center of mass location. Soc Neurosci Abstr 78.11, 2009.
- A13. Wei Zhang, Jamie A. Johnston, Anthony A. Smith, Mark A. Ross, Brandon J. Coakley, Marco Santello. Sensorimotor integration for multi-digit grasping: effect of Carpal Tunnel Syndrome on trial-to-trial adaptation to object mass. Soc Neurosci Abstr, 2010.
- A14. Lisa Raleigh, Jamie Johnston, Marianne Merritt, Scott Duncan, Anthony Smith, Mark Ross, Marco Santello. Sensorimotor integration during multi-digit grasping in patients with Carpal Tunnel Syndrome. Soc Neurosci Abstr 167.15, 2007.

- A15. Jamie A. Johnston, Sara A. Winges, Marco Santello. Muscle-pair specificity of periodic common neural input to hand muscles during precision grip. Soc Neurosci Abstr 408.8, 2007.
- A16. Jamie A. Johnston, Sara A. Winges, Marco Santello. Modulation of the strength of periodic common neural input to hand muscles during precision grip is muscle-pair specific. Progress in Motor Control, 2007.
- A17. Jamie A. Johnston, Marianne Merritt, Anthony Smith, Scott Duncan, Mark Ross, Marco Santello. Impaired sensorimotor integration for multi-digit grasping in patients with Carpal Tunnel Syndrome. Orthopaedic Research Society, 2007.
- A18. Jamie A. Johnston, Marco Santello. Corrective force responses to perturbations to a three-digit grasp. Soc Neurosci Abstr 147.3, 2006.
- A19. Lisa M. Raleigh, Jamie A. Johnston, Marco Santello. Relations between EMG activity of intrinsic and extrinsic hand muscles as a function of wrist posture during two-digit grasping. Soc Neurosci Abstr 147.2, 2006.
- A20. J.A. Johnston, S.A. Winges, M. Santello. Periodic common input to extrinsic flexors in 2- and 5-digit grasping. Soc Neurosci Abstr 399.2, 2005.
- A21. Formicone G, Johnston JA, Hamm T, Santello M. Assessment of across-muscle coherence using multi-unit vs. single unit signals. Soc Neurosci Abstr 399.3, 2005.
- A22. Johnston JA, Winges SA, Santello M. Coherence of motor unit activity from hand muscles during multi-digit grasping. Soc Neurosci Abstr 188.13, 2004.
- A23. S.A. Winges, J.A. Johnston, M. Santello. Effect of grip type on the strength of common input to extrinsic finger flexors. Soc Neurosci Abstr 188.15, 2004.
- A24. Johnston J., Rearick M., Slobounov S. Movement-related cortical potentials associated with progressive muscle fatigue in a grasping task. Psychophysiological, 37: S52-S52; 2000.

Non-Refereed Abstracts:

Kyle Sanniec, Wei Zhang, Jamie A. Johnston, Anthony A. Smith, Mark A. Ross, Brandon J. Coakley, Elizabeth Gleason, Marco Santello. Effect of Carpal Tunnel

Syndrome on trial-to-trial adaptation to object center of mass — sensorimotor integration for multi-digit grasping. Mayo-ASU Annual Research Symposium, 2010.

Presentations:

Podium Presentations

Jamie A. Johnston. Sensorimotor integration during multi-digit grasping. Human Performance Laboratory, Oct 2010.

Jamie A. Johnston. Force coordination during multi-digit grasping in older adults. World Congress on Biomechanics, August 2010.

Jamie A. Johnston. Neural control of the hand: Periodic common input to hand muscle motoneurons. Hotchkiss Brain Institute, May 2009.

Jamie A. Johnston. Sensorimotor control underlying hand control in patients with carpal tunnel syndrome. Axon Biology and Nerve Regeneration Research Day. September 2009.

Jamie A. Johnston. Periodic common input to hand muscles: A mechanism for multi-digit grasp control? Alberta Motor Control Conference, Spring 2009.

Jamie A. Johnston. Correlation of hand muscle activity: Mechanism for coordinating multiple digit forces during grasping? Canadian Spring Conference for Behaviour and Brain, Spring 2009.

Jamie A. Johnston, Marianne V. Merritt, Scott F.M. Duncan, Anthony A. Smith, Mark A. Ross, Marco Santello. The effects of sensorimotor deficits on multi-digit grasping in patients with Carpal Tunnel Syndrome. Canadian Society for Psychomotor Learning and Sport Psychology, 2008.

Jamie A. Johnston. Impairments in anticipatory control of digit forces during multi-digit object manipulation in patients with Carpal Tunnel Syndrome. Human Performance Lab, University of Calgary, Fall 2008.

Jamie A. Johnston. Correlation of hand muscle activity: Mechanism for coordinating digit forces? The Health and Exercise Physiology Group, University of Calgary, Spring 2008.

Jamie A. Johnston. Neural control of the hand: Impaired sensorimotor integration in patients with Carpal Tunnel Syndrome. The Joint Injury and Arthritis Group, University of Calgary, Spring 2008.

Jamie A. Johnston. Neural control of the hand: Complementary approaches to understanding grip force control and coordination. The Behavioral Neuroscience Research Group, University of Calgary, Spring 2008.

Jamie A. Johnston. Sensorimotor integration underlying hand control in patients with Carpal Tunnel Syndrome. Department of Kinesiology, Arizona State University, Spring 2007.

Jamie A. Johnston. Correlated input to hand muscle motor units during grasping. Neuroscience Symposium, Arizona State University/Barrow Neurological Institute, Fall 2006.

Jamie A. Johnston. Assessment of across-muscle coherence using multi-unit vs. single-unit signals. Kinesiology Department Seminar, Arizona State University, Spring 2006.

Jamie A. Johnston, Marianne Merritt, Anthony Smith, Scott Duncan, Mark Ross, Marco Santello. Impaired sensorimotor integration for multi-digit grasping in patients with Carpal Tunnel Syndrome. Orthopaedic Research Society, 2007.

Poster Presentations

Jamie A. Johnston, Mostafa Afifi, Marco Santello. The use of visual information for multi-digit force adaptation to center of mass location in patients with Carpal Tunnel Syndrome. Society for Neuroscience, New Orleans, 2012.

Jamie A. Johnston, Sean P. Dukelow, Michael F. Dew. Flexion and extension enslavement patterns in male stroke patients. Society for Neuroscience, New Orleans, 2012.

Jamie A. Johnston, Sara A. Wings, Marco Santello. Muscle-pair specificity of periodic common neural input to hand muscles during precision grip. Society for Neuroscience, San Diego, 2007.

Jamie A. Johnston, Sara A. Winges, Marco Santello. Modulation of the strength of periodic common neural input to hand muscles during precision grip is muscle-pair specific. *Progress in Motor Control*, 2007.

Lisa Raleigh, Jamie Johnston, Marianne Merritt, Scott Duncan, Anthony Smith, Mark Ross, Marco Santello. Sensorimotor integration during multi-digit grasping in patients with Carpal Tunnel Syndrome. *Society for Neuroscience, San Diego*, 2007.

Jamie A. Johnston, Marco Santello. Corrective responses to perturbations of force sharing patterns. *Neural Control of Movement, Key Biscayne, FLA* 2006.

Formicone G, Johnston JA, Hamm T, Santello M. Assessment of across-muscle coherence using multi-unit vs. single unit signals. *Society for Neuroscience, Washington DC*, 2005.

Jamie A. Johnston, Sara A. Winges, Marco Santello. Oscillatory modulation of motor unit activity of extrinsic hand muscles during multi-digit grasping. *Neural Control of Movement, Sitges, Spain*, 2004.

Johnston JA, Winges SA, Santello M. Coherence of motor unit activity from hand muscles during multi-digit grasping. *Society for Neuroscience, San Diego*, 2004.

S.A. Winges, J.A. Johnston, M. Santello. Effect of grip type on the strength of common input to extrinsic finger flexors. *Society for Neuroscience, San Diego* 2004.

Johnston J., Rearick M., Slobounov S. Movement-related cortical potentials associated with progressive muscle fatigue in a grasping task. *Society for Psychophysiological Research*, 2000.

Invited Speaker

Control of the hand: Complementary approaches to understanding a complex system. *Physical Education & Recreation Faculty, University of Alberta*, 2012.

Coordination of forces in older adults during multi-digit grasping. *World Congress on Biomechanics, Singapore 2010 (Session Chair)*.

Neural control of the hand: The distribution of periodic common input to motor units of hand muscles. *Biomedical Engineering Department, University of Minnesota, Spring 2007*.

Neural control of the hand: Complementary research approaches to understanding a complex system. Center for Neuroscience and Neurological Recovery, Methodist Rehabilitation Center, Jackson MS, Spring 2007.

Neural control of the hand: Complementary approaches to understanding grip force control and coordination. Faculty of Kinesiology, University of Calgary, Spring 2007.

Cortical activity associated with postural finger tremor. Kinesiology Department, Arizona State University, Spring 2003.

Cortical activity associated with postural finger tremor. National Institute of Neurological Disease and Stroke, NINDS, National Institutes of Health, Spring 2003.

Media and Community Outlets

Sixty Second Science Video: Research in the Neurophysiology of Movement Laboratory, Alberta Innovates – Health Solutions, Fall 2010.

Cell-phone elbow: The contribution of cell-phone use on upper extremity repetitive stress injuries, CBC Radio Segment, Summer 2009.

Carpal tunnel syndrome hurts hand dexterity, R&D Magazine Article, November 19, 2008. <http://rdmag.com/News/2008/11/Carpal-tunnel-syndrome-hurts-hand-dexterity/>

Funding

Ongoing Support:

National Institutes of Health RO1:	7/1/2008 – 6/30/2012 Amount: \$235,722.65 (CAN\$) Title: Sensorimotor integration underlying grasp control in Carpal Tunnel Syndrome Sponsor: NICHD Role: Co-Principal Investigator
University of Calgary -Seed Grant:	9/1/2012 – 8/31/2013 Amount: \$18,000 Title: The effects of muscle vibration during static and dynamic changes in muscle length on corticospinal excitability.

Role: Principle Investigator

Completed Support:

Canada 11/05/2010 – 6/15/12
Foundation for Amount: Equipment
Innovation (CFI): Title: Cognitive and Motor Neuroscience Lab for the study of
movement in average and special human populations
Role: Principal Investigator (Transfer from Dr. Timothy Welsh)

University of 05/01/2008
Calgary Amount: \$16,500 (CAN\$)
-Starter Grant: Title: Grip force coordination associated with changes in object
weight in patients with Carpal Tunnel Syndrome
Role: Principal Investigator

National 8/1/2005-7/31/2007
Institutes Amount: \$92,272 (US\$)
of Health NRSA Title: Perturbation to force sharing patterns in 5-digit grasps
Postdoctoral Sponsor: NIAMDS
Fellowship:

NASA Space 9/1/2000-5/31/2002
Grant Amount: \$5,000 (Stipend; US\$)
Fellowship: Title: Movement-related cortical potentials associated with
progressive muscle fatigue in a grasping task.

Graham 9/1/1998-5/31/1999
Endowed Awarded by: The Pennsylvania State University
Fellowship: Amount: \$4,000 (Stipend; US\$)

Supervisory Record

Postdoctoral Trainees

2010 - 2012 **Dr. Mostafa Afifi**. *Multi-digit object manipulation in individuals with
Carpal Tunnel Syndrome (2 Studies)*

Graduate Students

Supervisor

F2011- Present **Jason Robertson**. M.Sc. in Biomedical Engineering (current).
Modifying muscle properties in a leading neuromuscular model: the

Fuglevand model revisited. Funded by NSERC PGS M and CREATE Awards.

F2010 - Present **Mike Lane.** M.Sc. in Kinesiology (completed). *The effects of muscle belly vibration at varying muscle lengths on corticospinal excitability: A TMS study.*

F2010 – W2013 **Mike Dew.** M.Sc. in Kinesiology (completed). *The development and clinical application of the Dextrometer for measuring hand function in acute stroke patients.*

F2008 - W2010 **Christie Schmidt.** M.Sc. in Kinesiology (completed; 4 +1 Student). *Sensorimotor integration in healthy elderly during multi-digit grasping.* Funded by CIHR.

Co-supervisor

F2009 – W2010 **Stephanie Paulson.** M.Sc. in Kinesiology (completed). *The influence of body-part preprogramming on visual search strategy.* Co-supervised with Dr. Tim Welsh now at University of Toronto.

F2009 – W2010 **Matthew Ray.** Ph.D. in Kinesiology (discontinued, now at University of Toronto). Co-supervised with Dr. Tim Welsh now at University of Toronto.

Supervisory Committee Member

F2011 – Present **Hendrik Enders.** M.Sc. in Kinesiology (current). TBD. Internal Committee Member.

F2011 - Present **Payam Zandiyeh.** Ph.D. in Mechanical Engineering (current). TBD. External Committee Member

F2010 - W2011 **Karelia Tecante.** M.Sc. in Mechanical Engineering (completed). *A novel approach to measure dynamic stability during walking.* External Committee Member

2010 **Dawson Kidgell.** Ph.D. in Sport and Exercise Science, Victoria University, Australia (completed). *Physiological studies investigating neurological adaptations to resistance training.* Examiner

- F2009-S2010 **Sean Osis**. M.Sc. in Kinesiology (completed). *Perception of driver shaft flex and adaptation during the golf swing*. Internal Committee Member
- F2008 - S2009 **Laura McDougall**. M.Sc. in Kinesiology (completed). *Abnormal surround inhibition in the unaffected limb of those with cervical dystonia: A transcranial magnetic stimulation study*. Internal Committee Member
- 2008 **Catherine Phillips**. M.Sc. in Psychology (completed). *The behavioural phenotype of mice following neonatal or adult lesions of the medial frontal cortex*. External Committee Member

Neutral Chair

- 2012 **John William Wannop**. Ph.D. in Kinesiology. *Footwear Traction and Lower Extremity Non-Contact Injury*.
- 2012 **Angela Karlos**. MD/M.Sc. (Leaders in Medicine). *The Effect of the 1p13.3 Cholesterol Associated Locus on LDL Cholesterol in a Young Adult, Canadian Population*.
- 2012 **Nathalie Trottier**. M.Sc. in Kinesiology. *The Effectiveness of Osteopathic Manual Treatment in the Conservative Management of Infants with Deformational Plagiocephaly and Congenital Muscular Torticollis*
- 2011 **Michael DuVall**. Ph.D in Biomedical Engineering. Candidacy Exam.
- 2011 **Michael MacKenzie**. Ph.D. in Kinesiology; Candidacy Exam.
- 2011 **Margot Ellis**. M.Sc. in Kinesiology. *Combination Treatment for Knee Osteoarthritis*.
- 2011 **Erin Korsbrek**. M.Sc. in Kinesiology. *Effect of a Commercially Available Virtual Reality Based Videogame*.
- 2010 **Jared Fletcher**. Ph.D. in Kinesiology; Candidacy Exam.
- 2010 **Graeme Challis**. M.Sc. in Kinesiology. *The Effect of Acute Heat Exposure and Handcooling on Power Output During Ballistic Strength Training*.
- 2010 **Robert Kosior**. Ph.D. in Biomedical Engineering. *Better Diagnoses of Stroke and Epilepsy with Quantitative MR Assessment*.

- 2010 **Wendy Verity.** M.Sc. in Kinesiology and Medical Science. *The Effect Of Exercise Intensity On Airway And Systemic Inflammation In Patients With Chronic Obstructive Pulmonary Disease.*
- 2010 **Neal Austin.** M.Sc. in Kinesiology. *Insights into the in vivo Mechanical Properties of Human Skeletal Muscle During Dynamic Contractions.*
- 2009 **Gavin Hamilton.** M.Sc. in Kinesiology. *An Analysis of Injury Definitions, Consequences of Injury and Recurring Injuries in the Cirque du Soleil.*
- 2009 **Tyler Cameron.** M.Sc. in Kinesiology. *The Effects of Motivational Imagery and Perceived Difficulty of a Golf-Putting Task on Emotional States and Performance in Novice and Expert Golfers.*
- 2009 **Tiffany Edgecombe.** Ph.D. in Mechanical & Manufacturing Engineering. *The Effects of Ski Boot Ramp Angle on Postural Control and On-Hill Turn Kinetics.*
- 2008 **Megan Yaraskavitch.** MD/M.Sc. in Kinesiology. *Changes in Passive Muscle Properties and Titin in Spastic Cerebral Palsy.*
- 2008 **Shelley Fried.** M.Sc. in Kinesiology. *The Development of an Objective and Accurate Instrument to Measure Game Performance in Female Minor Ice Hockey Players.*
- 2008 **Joshua Nugent.** M.Sc. in Kinesiology. *Effects of Manipulating Attentional Focus on the Gaze Behaviors and Accuracy of Fly Casters.*
- 2008 **Derek Panchuk.** Ph.D. in Kinesiology; *Rapid Interceptive Actions: Predictive or Prospective Control?*

Undergraduate Students

- F2011 -W2012 **Courtney Phillips** (B.Sc. Knes Honours candidate). *The effects of inaccurate proprioceptive feedback in grip and load force coordination.*
Kinesiology B.Sc. Honours Project

- F2010 - W2011 **Shirlee Ren** (B.Sc. Sci candidate). *Effects of acute sensory deficits in target fingers on multi-digit grasping with changes in object center of mass.* Funded by: Undergraduate Student Research Project (USRP). Currently at the University of Alberta Medical School.
- F2010 - W2011 **Jason Robertson** (B.Sc. Knes candidate) *Multi-digit object manipulation as a function of various external torques in 2-dimensions.* KNES 466 Class Project. Currently a M.Sc. candidate in Biomedical Engineering.
- S2010 **Jason Robertson** (B.Sc. Knes candidate). *Development of a quantitative hand function assessment tool for stroke patients.* Funded by: NSERC Create Undergraduate Summer Studentship Programme. Currently a M.Sc. candidate in Biomedical Engineering.
- S2010 **Grant Cechmanek** (B.Sc. Mechanical Engineering/Psychology candidate). *Computer model of the biomechanical and neural constraints on digit actions by the hand.* Funded by: NSERC Create Undergraduate Summer Studentship Programme
- S2010 **Shirlee Ren** (B.Sc. Sci candidate). *Effects of acute sensory deficits in target fingers on multi-digit grasping with changes in object weight.* Funded by: Undergraduate Student Research Project (USRP). Currently at the University of Alberta Medical School.
- S2010 **Nicole Meyer** (B.Sc. Neuroscience candidate). *Roles of visual and tactile information during grasping with changes in object center of mass.* Funded by: Neuroscience Summer Research Program.
- S2009 **Abraham Nunes** (incoming M.Sc. candidate) *Muscle coordination during selective muscle fatigue.* Funded by: NSERC Create Undergraduate Summer Studentship Programme. Currently at the University of Alberta Medical School.
- F2008 –W 2009 **Christie Schmidt** (B.Sc. Knes candidate; 4 +1 Student). *Differences in sensorimotor integration capabilities between older and younger adults as determined by varying center of mass location during grasping.* Kinesiology B.Sc. Honours Project.

Undergraduate Employees

- S2011 **Jason Kliiger.** Recruiting patients with carpal tunnel syndrome from Foothills EMG labs to participate in our study
- F2010 **Andrea Loria.** Recruiting patients with carpal tunnel syndrome from Rockyview EMG labs to participate in our study
- S2010 **Olivia McCreary.** Recruiting patients with carpal tunnel syndrome from Foothills EMG labs to participate in our study
- W2009 **Ben Chan.** Recruiting patients with carpal tunnel syndrome from Rockyview Hospital EMG labs to participate in our study
- W2010 **Sara Lindsay.** Recruiting patients with carpal tunnel syndrome from Foothills Hospital EMG labs to participate in our study

High School students

- S2012 **Karly Zouppas** (High School Student). *Effects of a severed median nerve on bilateral transfer during grasping: A case study.* Funded by: Alberta Heritage Foundation for Medical Research - Heritage Youth Researcher Summer (HYRS) Program.
- S2011 **Emily Bolton** (High School Student). *Impact of muscle length on cortical excitability as a function of vibration.* Funded by: Alberta Heritage Foundation for Medical Research - Heritage Youth Researcher Summer (HYRS) Program.
- S2010 **Andrew Jung** (High School Student). *Effects of texture on sensorimotor integration during multi-digit grasping in patients with Carpal Tunnel Syndrome.* Funded by: Alberta Heritage Foundation for Medical Research - Heritage Youth Researcher Summer (HYRS) Program.
- S2009 **Kaiz Alarakya** (High School Student). *Electromyography and muscle activity.* Funded by: Alberta Heritage Foundation for Medical Research - Heritage Youth Researcher Summer (HYRS) Program.

Laboratory Volunteers

Kouki Nagoya, Japan Exchange Student, Ph.D. candidate

Karelia Tecante, M.Sc. in Mechanical Engineering

Jason Kliiger, B.A./B.Sc. in Sociology/Biological Sciences, respectively

Meika Stewart, B.Sc. candidate in Kinesiology
Grant Cechmanek, B.Sc. candidate in Mechanical Engineering/Psychology
Kimberly Mikalson, B.Sc. candidate in Kinesiology/Psychology
Sepideh Souiri, B.Sc. candidate in Kinesiology
Ivan Mak, B.Sc. candidate in Mechanical Engineering

Trainee Presentations:

Podium Presentations

Mike Lane, Jamie A. Johnston. Effects of vibration of a muscle at varying lengths on corticospinal excitability. Alberta Motor Control Conference, 2012.

Jason W. Robertson, Jamie A. Johnston. The development of grip and moment control during a grasp, lift and hold task. Alberta Motor Control Conference, 2012.

Michael Dew, Sean Dukelow, Jamie A. Johnston. The measurement of force production in stroke patients with a novel device, the Dextrometer. Alberta Motor Control Conference, 2012.

Mostafa Afifi, Jamie A. Johnston: Effects of a severed median nerve on bilateral transfer during grasping: a case study. Alberta Motor Control Conference, 2012.

Jason W. Robertson, Jamie A. Johnston. The development of grip and moment control during a grasp, lift and hold task. Alberta Biomedical Engineering Conference, 2012.

Mostafa Afifi, Marco Santello, Jamie A. Johnston. Multi-digit force adaptation to texture in patients with Carpal Tunnel Syndrome. Human Performance Lab, 2011.

Robertson JW, Johnston JA. The principal of superposition when grasping an object exerting two-dimensional external moments. Human Performance Lab, 2011.

Robertson JW, Johnston JA. The principal of superposition when grasping an object exerting two-dimensional external moments. Alberta Motor Control Conference, 2011.

Mostafa Afifi, Marco Santello, Jamie A. Johnston. Multi-digit force adaptation to texture in patients with Carpal Tunnel Syndrome. Alberta Motor Control Conference, 2011.

Christie Schmidt, Jamie A. Johnston. Sensorimotor Integration in Healthy Older Adults During Whole-Hand Object Manipulation. Alberta Motor Control Conference, 2011.

Shirlee Ren, Preston Wiley, Jamie A. Johnston. Effects of vision and tactile deficits on whole hand object manipulation. Alberta Motor Control Conference, 2011.

Grant Cechmanek, Jamie A. Johnston. Effects of common input on muscle force coherence: A simulation study. Alberta Motor Control Conference, 2010.

Jason W. Robertson, Jamie A. Johnston. A Novel Stroke Assessment Tool Measuring Individual Finger Forces and Torques. Alberta Motor Control Conference, 2010.

Shirlee Ren, Preston Wiley, Jamie A. Johnston. Effects of acute sensory deficits on grasping objects of different weights. Alberta Motor Control Conference, 2010.

Nicole Meyer, Jamie A. Johnston. Roles of visual and tactile information during grasping with changes in object center of mass. Alberta Motor Control Conference, 2010.

Poster Presentations:

Michael D. Lane, Jamie A. Johnston. Effects of vibration of a muscle at varying lengths on corticospinal excitability. Society for Neuroscience, New Orleans 2012.

Jason W. Robertson, Jamie A. Johnston. The development of grip and moment control during a grasp, lift and hold task. Society for Neuroscience, New Orleans 2012.

Karly Zouppas, Jamie Johnston, **Mostafa Afifi**. Effects of a severed median nerve on bilateral transfer during grasping: A case study. HYRS Research Day, 2012.

Robertson JW, Johnston JA. The principal of superposition when grasping an object exerting two-dimensional external moments. Alberta Biomedical Engineering Conference, 2011. *Poster Award Finalist*.

Emily Bolton, **Mike Lane**, and Jamie Johnston. Impact of muscle length on cortical excitability as a function of vibration. HYRS Research Day, 2011.

Jason W. Robertson, Sean Dukelow, Kenneth Lam, Jamie A. Johnston. A Novel Stroke Assessment Tool Measuring Individual Finger Forces and Torques. Alberta Biomedical Engineering Conference, 2010. *Poster Award Finalist*.

Grant Cechmanek, Jamie A. Johnston. Effects of common input on muscle force coherence: A simulation study. Alberta Biomedical Engineering Conference, 2010.

Andrew Jung, **Mostafa Afifi**, Jamie A. Johnston. Effects of texture on sensorimotor integration during multi-digit grasping in patients with Carpal Tunnel Syndrome. HYRS Research Day, 2010.

Kaiz Alarakya, **Abraham Nunes**, Jamie A. Johnston. EMG and muscle activity. HYRS Research Day, 2009.

Christie Schmidt, Jamie A. Johnston. Sensorimotor Integration in Healthy Older Adults During Whole-Hand Object Manipulation. Society for Neuroscience, Washington D.C., 2009.

Trainee Funding:

NSERC CREATE
Academic Leaders
Studentship

Jason Robertson (2012-2013). *Modifying muscle properties in a leading neuromuscular model: the Fuglevand model revisited.*

Natural Science and
Engineering Council
PGS M

Jason Robertson (2011-2012). *The integration of common neural input and hand biomechanics in grasping: A computer simulation study.*

Canadian Institutes
of Health Research

Christie Schmidt (2008-2010). *Sensorimotor integration in healthy elderly during multi-digit grasping.*

Undergraduate
Student Research
Project

Shirlee Ren (Fall 2010). *Effects of acute sensory deficits in target fingers on multi-digit grasping with changes in object center of mass.*

Natural Science and
Engineering Council
Create Undergraduate
Summer Studentship

Jason Robertson (Summer 2010). *Development of a quantitative hand function assessment tool for stroke patients.*

Natural Science and
Engineering Council
Create Undergraduate

Grant Cechmanek (Summer 2010). *Computer model of the biomechanical and neural constraints on digit actions by the hand.*

Summer Studentship

Undergraduate Student Research Project **Shirlee Ren** (Summer 2010). *Effects of acute sensory deficits in target fingers on multi-digit grasping with changes in object weight.*

Natural Science and Engineering Council Create Undergraduate Summer Studentship **Abraham Nunes** (Summer 2009) *Muscle coordination during selective muscle fatigue.*

<h2>Teaching Experience</h2>

Current Position

05/2007 - Present **Assistant Professor**, University of Calgary, Calgary AB, Faculty of Kinesiology; Member: Pedagogy and Mind Sciences Programs; Member: Biomedical Engineering Graduate Faculty

Courses Taught:

W2013	Principal Instructor – KNES 403: Health Promotion, 18 undergraduate students
F2012	Principal Instructor – KNES 353: Neural Basis of Movement, 55 undergraduate students
W2012	Principal Instructor - KNES 403: Health Promotion, 24 undergraduate students
F2011	Principal Instructor - KNES 353: Neural Basis of Movement, 48 undergraduate students
F2011	Co-Instructor- KNES 609: Statistical Techniques in Kinesiology, 15 graduate students
W2011	Principal Instructor - KNES 403: Health Promotion, 15 undergraduate students
W2011	Principal Instructor - KNES 353: Neural Basis of Movement/Directed Study, 1 undergraduate student

F2010	Principal Instructor - KNES 353: Neural Basis of Movement, 46 undergraduate students
F2010	Principal Instructor - KNES 653.01: Neural Basis of Movement, 1 graduate student
F2010	Co-Instructor - KNES 609: Statistical Techniques in Kinesiology, 21 graduate students
W2010	Principal Instructor - KNES 403: Health Promotion, 17 undergraduate students
F2009	Co-Instructor - KNES 609: Statistical Techniques in Kinesiology, 16 graduate students
W2009	Co-Instructor - KNES 503: Current Issues in Cognitive and Neural Motor Control, 3 undergraduate students
W2009	Co-Instructor - KNES 653.04: Current Issues in Cognitive and Neural Motor Control, 2 Masters students
W2009	Co-Instructor - KNES 751: Current Issues in Cognitive and Neural Motor Control, 1 Ph.D. student
F2008	Principal Instructor - KNES 603.84: Statistical Techniques in Kinesiology, 18 graduate students

Lectures Given:

Fall 2011	KNES 465: Physiological Basis for Adaptations to Environmental Stress; Neural adaptations to exercise; 1 hour lecture
Fall 2010	KNES 615: Applied Exercise Physiology; <i>Neuromuscular physiology in disease</i> ; 10 Graduate Students; 1 hour lecture
Winter 2010	KNES 355: Human Growth and Development; <i>Neural development in utero</i> ; 100 Undergraduate Students; 1 hour lecture

- Winter 2010 KNES 355: Human Growth and Development; *Neural development through the lifespan*; 100 Undergraduate Students; 1 hour lecture
- Winter 2010 KNES 355: Human Growth and Development; *Motor development/learning*; 100 Undergraduate Students
- Fall 2009 KNES 615: Applied Exercise Physiology; *Neuromuscular physiology in disease*; 10 Graduate Students
- Winter 2009 KNES 355: Human Growth and Development; *Neural development in utero*; 100 Undergraduate Students

Journal Club:

- 2008 - 2012 Organized a combined graduate and undergraduate journal club to expose our students to current literature in motor neuroscience and engineering.

Previous Positions

- Fall 2007 **Adjunct Faculty**, Arizona State University, Tempe, Az
Kinesiology Department

Courses Taught:

- F2007 Principal Instructor - KINES 494: Neurophysiology of Movement; 29 Undergraduate Students
- F2007 Principal Instructor - KINES 598: Neurophysiology of Movement; 1 Graduate Student
- 1998- 2003 **Teaching Assistant**, Pennsylvania State University,
University Park, PA
Kinesiology Department

Lectures Given:

- Spring 2003 KINES 321: Psychology of Movement; *Biofeedback*; 150 Undergraduate Students; 1 hour lecture
- Spring 2003 KINES 321: Psychology of Movement; *Psychology of Sport Injury and Burnout*; 150 Undergraduate Students; 1 hour lecture

- Fall 2000 KINES 321: Psychology of Movement; *Psychology of Sport Injury*; 150 Undergraduate Students; 1 hour lecture
- Spring 2000 KINES 321: Psychology of Movement; *Control Theory*; 150 Undergraduate Students; 1 hour lecture
- Fall 1998 KINES 321: Psychology of Movement; *Coaching Styles*; 150 Undergraduate Students; 1 hour lecture
- 1996-1998 Computer Science Instructor/Varsity Basketball Coach (8-12th grades), Canterbury School, Ft. Myers, FL**
- 1993-1996 Computer Science Instructor/Middle School Volleyball/Basketball/Softball/Assistant Varsity Basketball Coach (8-12th grades), Isidore Newman, New Orleans, LA**

Professional Service and Volunteer Work

Professional Service

Journal Reviewer

- BMC Neuroscience (2012 – present)
Journal of Motor Behavior (2012 – present)
Biomedical Signal Processing and Control (2012-present)
Footwear Science (2011-present)
Journal of Biomechanics (2010-present)
Behavioral Brain Research (2010-present)
Journal of Hand Therapy (2010-present)
European Journal of Neuroscience (2010-present)
Journal of Applied Physiology (2010-present)
Journal of Rehabilitation Science (2010-present)
Human Movement Science (2009-present)
IEEE: Transactions on Neural Systems & Rehabilitation Engineering (2008-present)
Medicine & Science in Sport & Exercise (2008-present)
Experimental Brain Research (2008-present)
Journal of Neurophysiology (2006-present)

Grant Reviewer

National - Natural Sciences and Engineering Research Council of Canada Global Partnerships Program (2008)

Internal – Programs for Undergraduate Research Experience Awards (2011)

Presentation Judge

Hotchkiss Brain Institute Research Day (2011), University of Calgary – Poster Judge

Research in Engineering and Applied Science Symposium (2006) – Scientific Paper Judge

Graduates in Earth, Life and Social Sciences Symposium (2004) – Oral Presentation Judge

International Conference Symposium Chair

“Hand and finger coordination” World Congress on Biomechanics, Singapore 2010

Service Committees

Biomedical Engineering Graduate Scholarship Committee (2012-present)

Faculty Promotions Committee (2011) – non-voting

University Academic Appeals Committee (2011-present)

Conjoint Health Research Ethics Board (2010 - present)

- Co-chair undergraduate ethics review committee

Campus Recreation and Athletics Committee (2009 – present)

Graduate Education Committee (2009 – present)

Curriculum Policy Committee (2008 – 2010)

Affiliations

Association of Canadian Ergonomists (2012 – present)

Editor’s Association of Canada (2012 – present)

Hotchkiss Brain Institute (2008-present)

- Axon Biology and Regeneration Research Theme

- Neural Systems and Behaviors

McCaig Institute of Bone and Joint Health (2008-present)

List of Biomedical Engineering Faculty (2008-present)

The Society for Neuroscience (2004-present)

The Society for the Neural Control of Movement (2004-present)

Organized International Guest Lecture Seminars

Dr. Simon Gandevia - Deputy Director and Foundation Scientist, Co-Director of the Spinal Injuries Research Centre, Prince of Wales Medical Research Institute; Senior Principal Research Fellow, National Health and Medical Research Council, AU, Winter 2010

Dr. Minoru Shinowara - Associate Professor, School of Applied Physiology, Georgia Institute of Technology, Research Scientist, Atlanta VA Rehab R&D Center, US, Winter 2010

Dr. Roger Lemon – Sobell Chair of Neurophysiology, Institute of Neurology, University College London, UK, Fall 2009

Laboratory Tours

HYRS Program (2012)

Waseda University Visitors Lab Demo and Tour (2011)

HYRS Program (2011)

HYRS Program (2010)

Human Performance Lab Open House (2010)

HYRS Program (2009)

Human Performance Lab Open House (2008)

Undergraduate Orientation

Welcome to Mind Sciences Presentation (2011)

Welcome to Mind Sciences Presentation (2010)

Welcome to Mind Sciences Presentation (2009)

Volunteer Work

Basketball Official (1998-1999). Pennsylvania Interscholastic Athletic Association, State College, PA; Officiated girl's high school basketball games

Basketball Coach (1997-1998) AAU Club Basketball Ft. Myers, FL; Initiated the formation of new club basketball organization in Ft. Myers area as well as coached 10-under and 12-under teams

Vice-President (1997-1998) Florida High School Athletic Association Ft. Myers, FL; Responsibilities included helping to organize meetings and making award nominations to the state