

CHRISTOPHER K. THOMPSON

CURRICULUM VITAE

January 10, 2013

CURRENT POSITIONS

Post-Doctoral Fellow

Sensory Motor Performance Program, Rehabilitation Institute of Chicago, Chicago, IL

Department of Physiology, Northwestern University, Chicago, IL

Physical Therapist

Registry, Rehabilitation Institute of Chicago, Chicago, IL

CONTACT

Rehabilitation Institute of Chicago

Sensory Motor Performance Program

345 E. Superior St., rm. 1382B, Chicago, IL 60611

Northwestern University

Department of Physiology

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EDUCATION

University of Illinois at Chicago, IL

Ph.D.

Movement Science

Aug 2012

University of Illinois at Chicago, IL

DPT

Physical Therapy

June 2009

Miami University, OH

B.A.

Psychology

June 2004

Dissertation Title:

Wind-Up of Spinal Neurons Contributes to
Supramaximal Volitional Torque in Human Spinal Cord Injury

Chairperson:

T. George Hornby, PT, PhD

07/02/12

PROFESSIONAL LICENSE

Physical Therapist, State of Illinois, IDPR, Division of Professional Regulation,

License No. 070.017190

CLINICAL EXPERIENCE

Rehabilitation Institute of Chicago, Chicago, IL

Jun. 2009 – Present

Physical Therapist

Rehab setting; work on a registry basis primarily on the CVA, TBA and SCI floors

John H. Stroger Jr. Hospital of Cook County, Chicago, IL

Jan. – Mar. 2009

Physical Therapy Intern

Acute care setting; trained primarily in trauma, neurological and surgical intensive care units

NorthShore Rehabilitation, Evanston, IL

Sept. – Nov. 2008

Physical Therapy Intern

Outpatient setting; treated individuals with a wide variety of orthopedic and neurological conditions

ALL Therapy Services, Chicago, IL

Apr. – Aug. 2008

Physical Therapy Intern

Early Intervention; treated children (age 0-3) with neurological, genetic and developmental conditions

Swedish Covenant Hospital, Chicago, IL

July 2007

Physical Therapy Intern

Inpatient acute rehab; trained in the neurological rehabilitation ward

Athletico Physical Therapy, Chicago, IL

May 2005 – April 2008

Physical Therapy Aide

Outpatient setting; assisted in treatment of individuals with orthopedic injuries

RESEARCH EXPERIENCE

Northwestern University, IL

Department of Physiology

Dr. Charles (CJ) Heckman. Mechanisms of force generation in the decerebrate cat

Aug. 2012 – present

University of Nebraska, Omaha, NE

Department of Health Physical Education and Recreation

Dr. Nicholas Stergiou. Variability of community mobility in individuals with SCI

July 2010 – present

Rehabilitation Institute of Chicago, Chicago, IL

Sensory Motor Performance Program

Dr. T. George Hornby. Mechanisms of weakness and 'fatigue' in human SCI

May 2006 – present

University of Illinois at Chicago, Chicago, IL

Department of Physical Therapy

Dr. Clive Pai. Analysis of human gait in perturbed environments

Jan. – June 2008

Northern Illinois University, DeKalb, IL

Department of Cellular Biology

Dr. David Lotshaw. Ion channel mechanics of renal systems in the rat

Aug. 2004 – June 2005

Miami University, Oxford, OH

Department of Psychology

Dr. Stephan Berry. *In vivo* field potential contributions to memory in the rabbit

Dr. Leonard Mark. Perceptual influences on state transitions during human reaching

Jan. 2002 – June 2004

TEACHING EXPERIENCE

Northwestern University, Evanston, IL

School of Engineering – Engineering Design and Communication

2009-2011

Lead two groups of freshman engineering students (5-7 students) to develop a position feedback controller for a split belt treadmill and robotic tendon tapper for human reflex testing

University of Illinois at Chicago, Chicago, IL

Department of Physical Therapy – PT 605: Plasticity of Tissue and Organ Systems

2008 – 2012

Lectured Physical Therapy students (30-60 students) on topics focusing on cortical and segmental mechanisms of force generation

Department of Physical Therapy – PT 562: Neural Plasticity and Pathophysiology

2011 – 2012

Lectured Graduate and Continuing Education students (25 students) on topics focusing on reorganization of the nervous system following spinal cord injury with emphasis on rehabilitation

FUNDING

American College of Sports Medicine Foundation | FRG 21

Thompson (PI)

Towards application of maximal exercise in human SCI

7/1/11 – 6/30/12

\$4,620

Individuals with incomplete SCI increase their maximal volitional torque generation during a fatiguing protocol. This project will 1) describe the volitional behaviors which elicit and 2) the motor unit activity which underlies this supramaximal torque generation in preparation for a clinical training protocol.

HONORS AND AWARDS

PODS II Scholarship, Pittsburgh–Marquette Challenge Award, Foundation for Physical Therapy

2012

Post-Professional Research Award, Neurology Section, American Physical Therapy Association

2012

Sarah Baskin Award, Rehabilitation Institute of Chicago

2011, 2012

Lillian B. Torrance Scholarship, University of Illinois at Chicago

2008, 2009, 2010

Florence Kendall Scholarship, Foundation for Physical Therapy

2009

Donna K. Roach Award, University of Illinois at Chicago

2009, 2010

Finalist, Image of Research, University of Illinois at Chicago

2008

Second Place, Graduate Research Forum, University of Illinois at Chicago

2007

Graduate Research Assistantship, University of Illinois at Chicago

2006 – 2012

PROFESSIONAL ACTIVITIES

Illinois Physical Therapy Association, IL

Assembly Representative, Eastern District

Jan. 2012 – Jan. 2013

Rehabilitation Institute of Chicago, Chicago, IL

Advisory Board Member, BRAIN database

June 2009 – Present

Research Representative, Physical Therapy Practice Council

Nov. 2009 – Present

Chair, Physical Therapy Practice Council

June 2011 – Jan. 2013

Vice-Chair, Physical Therapy Practice Council

Nov. 2010 – June 2011

University of Illinois at Chicago, Chicago, IL

Class President, Department of Physical Therapy

Class of 2009

Alumni Judge, UIC Student Research Forum

Apr. 2008

Student Tutor: Human Physiology, Neuroanatomy,

Sept. 2007 – Dec. 2008

Biomechanics, Functional Histology

PROFESSIONAL AFFILIATIONS

American Physical Therapy Association, Research and Neurology Section member

American College of Sports Medicine

Illinois Physical Therapy Association, Eastern District member

Society for Neuroscience

Sigma Xi, University of Illinois at Chicago Chapter

PUBLICATIONS

Published

Thompson CK, and Hornby TG. Divergent modulation of clinical measures of strength and spasticity in human incomplete spinal cord injury via serotonergic medication. *J Neurotrauma* [in press]

Jayaraman A, **Thompson CK**, Rymer WZ, and Hornby TG. Short-term maximal intensity resistance training increases volitional function and strength in chronic incomplete spinal cord injury: A pilot study on clinical outcomes. *J Neurol Phys Ther* [in press]

Thompson CK, Lewek MD, Jayaraman A, and Hornby TG. Central excitability contributes to supramaximal volitional contractions in human incomplete spinal cord injury. *J Physiol*, 2011. (589 Pt 15): 3739-52. PMID: 21610138

Frigon A, **Thompson CK**, Johnson MD, Hornby TG, and Heckman CJ. Sustained contractions evoked by electrically stimulating the muscle or its nerve are generated and modulated by a length-dependent intrinsic property of muscle in humans and cats. *J Neurosci*, 2011. (31): 5579-5588. PMID: 21490198

Thompson CK, Jayaraman A, Kinnaird CR, and Hornby TG. Methods to quantify pharmacologically induced alterations in motor function in human incomplete SCI. *J Vis Exp*, 2011. (50). PMID: 21525848

Hornby TG, Lewek MD, **Thompson CK**, and Heitz R. Repeated maximal volitional effort contractions in human spinal cord injury: initial torque increases and reduced fatigue. *Neurorehabil Neural Repair*, 2009. 23(9): p. 928-38. PMID: 19478056.

Submitted

Thompson CK, Jayaraman A, and Hornby TG. Activation history modulates motor output in human incomplete spinal cord injury. [submitted to *J Physiol*]

ABSTRACTS

Oral Presentations

Thompson CK, Mottram CJ, Kim H, Suresh NL, and Hornby TG. Supramaximal volitional torque in humans with spinal cord injury: Reflexive and perceptual consequences. *International Motoneuron Meeting*. Sydney Australia; 25 July 2012.

Thompson CK, Kim H, Mottram CJ, Jayaraman A, and Hornby TG. Supramaximal volitional torque in humans with spinal cord injury: Associated motor behaviors. *XIX Congress of the International Society of Electrophysiology and Kinesiology*. Brisbane, Australia; 19 July 2012.

- Thompson CK**, Koutakis P, Kim HE, Leech K, Jayaraman A, Stergiou N, and Hornby TG. Objective measures of community mobility in persons with SCI: Preliminary finding from the MAPS project . *American Physical Therapy Association Combined Sections Meeting*, New Orleans, LA; 12 February 2011.
- Hornby TG, Hynstrom A, Jayaraman A, and **Thompson CK**. From Bench to Bedside: Translation of basic scientific findings of spinal cord physiology to clinically relevant interventions for individuals with spinal cord injury. *Research and Neurology Sponsored Education Session, American Physical Therapy Association Combined Sections Meeting*, New Orleans LA; 11 February 2011. (Three hour education session)
- Thompson CK**, and Hornby TG. Giving 110%: Generation of supramaximal torques in human spinal cord injury. *Sensory Motor Performance Program Seminar Series, Rehabilitation Institute of Chicago*. Chicago IL; 28 January 2011.
- Thompson CK**, and Hornby TG. Modulation of supramaximal volitional torques and spastic reflexes following pharmacological manipulation of serotonin in human incomplete spinal cord injury. *Marilyn Gossman Symposium, American Physical Therapy Association Combined Sections Meeting*, New Orleans, LA; 19 February 2010.
- Thompson CK**, and Hornby TG. 'Fatiguing' Volitional Contractions Increase Maximal Knee Extension Torques in Human SCI? Findings, Mechanisms and Future Directions. *Physical Therapy Departmental Seminar, University of Illinois at Chicago*. Chicago, IL; 16 April 2009.

Poster Presentations

- Leech KA, **Thompson CK**, Kinnaird CR, and Hornby TG. Effects of serotonergic agents on locomotor performance in individuals with motor incomplete spinal cord injury. *American Physical Therapy Association Combined Sections Meeting*, San Diego CA; Winter 2013. [in preparation]
- Hyosub HK, **Thompson CK**, and Hornby TG. Supramaximal torque production during repeated dynamic contractions in individuals with incomplete spinal cord injury. *American Physical Therapy Association Combined Sections Meeting*, San Diego CA; Winter 2013. [in preparation]
- Thompson CK** and Hornby TG. Modulation of motor behaviors following serotonergic medications in humans with incomplete spinal cord injury. *2012 Northwestern University Interdepartmental Neuroscience Retreat*, Saint Charles IL; Fall 2013.
- Klonowski MA, Pelo RM, Williams NM, Santiago RV, **Thompson CK**, Leech KA, Holleran C, Leddy A, and T.G. Hornby. Intensive Goal-Directed Treatments in Enriched Environments Augments Patient Outcomes. *2012 Illinois Physical Therapy Association Fall Conference*, Naperville IL; Fall 2013.
- Thompson CK**, Jayaraman A, and Hornby TG. Targeting supramaximal strength in incomplete spinal cord injury: time and intensity dependent increase in volitional torque generation. *American Physical Therapy Association Combined Sections Meeting*, Chicago, IL; Winter 2012.
- Thompson CK**, Jayaraman A, Kim HE, Suresh NL, Mottram CJ, and Hornby TG. Time and intensity dependent increase in motor unit activity contributes to the generation of supramaximal volitional torque in human spinal cord injury. *Society for Neuroscience Annual Meeting*, Washington, DC; Fall 2011.
- Thompson CK**, Hornby TG. Increased motor unit activation with decreased central drive in human spinal cord injury: Towards reconciliation of laboratory and clinical findings. *Northwestern University's Movement & Rehabilitation Sciences Training Day*. Chicago, IL; Summer 2011
- Trumbower RD, Jayaraman A, **Thompson CK**, Mitchell GS, and Rymer WZ. One-day exposure of acute intermittent hypoxia on somatic motor function in human SCI. *Society for Neuroscience Annual Meeting*, San Diego, CA; Fall 2010.
- Frigon A, **Thompson CK**, Heckman CJ, and Hornby TG. Joint angle-dependent modulation of plateau-like behavior in human motoneurons. *Society for Neuroscience Annual Meeting*. San Diego, CA; Fall 2010.
- Thompson CK**, Jayaraman A, and Hornby TG. Contributions of motoneuron excitability to volitional force-generation in human incomplete spinal cord injury. *Motoneuron Meeting*, Paris, France; Summer 2010
- Jayaraman A, **Thompson CK**, Rymer WZ, and Hornby TG. High-intensity intermittent vs. conventional resistance training: Impact on strength and function in individuals with incomplete spinal cord injury. *American Physical Therapy Association Combined Sections Meeting*. New Orleans, LA; Spring 2010.
- Thompson CK**, Jayaraman A, and Hornby TG. Serotonergic modulation of peak volitional torques and motoneuron excitability in human incomplete spinal cord injury. *Society for Neuroscience Annual Meeting*. Chicago, IL; Fall 2009.

- Jayaraman A, **Thompson CK**, Rymer WZ, and Hornby TG. Neural mechanisms underlying augmented volitional torque following noxious stimulus in individuals with incomplete spinal cord injury. *Society for Neuroscience Annual Meeting*. Chicago, IL; Fall 2009.
- Thompson CK**, Lewek MD, Jayaraman A, and Hornby TG. Central contributions to augmented motor output during fatiguing contractions in human incomplete spinal cord injury. *APTA Section on Research, Mechanisms Underlying Disordered Movement: Impairments with Force Generation*. Pacific Grove, CA; Summer 2009.
- Jayaraman A, **Thompson CK**, Rymer WZ, and Hornby TG. Neural mechanisms underlying augmented volitional torque following noxious stimulus in individuals with incomplete spinal cord injury. *Cellular and Network Functions in the Spinal Cord*. Madison, WI; Summer 2009.
- Jayaraman A, **Thompson CK**, and Hornby TG. Potential central and reflex contributions on augmented volitional torque in individuals with incomplete spinal cord injury. *American Physical Therapy Association Combined Sections Meeting*. Las Vegas, NE; Spring 2009.
- Thompson CK**, Lewek MD, Jayaraman A, and Hornby TG. Increased Spinal Excitability Contributes to Volitional “Warm-up” during Repeated Maximal Volitional Efforts in Incomplete Spinal Cord Injury. *American Physical Therapy Association Combined Sections Meeting*. Las Vegas, NE; Spring 2009.
- Hornby TG, **Thompson CK**, and Lewek MD. Potential neuromuscular mechanisms underlying torque augmentation during “fatiguing” contractions in human incomplete spinal cord injury. *Society for Neuroscience Annual Meeting*. San Diego, CA; Fall 2007.
- Lewek MD, Hornby TG, and **Thompson CK**. Torque output during repeated maximal voluntary isometric contractions in subjects with incomplete spinal cord injury. *Society for Neuroscience Annual Meeting*. San Diego, CA; Fall 2007.
- Thompson CK**, Lewek MD, and Hornby TG. Maximum voluntary isometric contractions in subjects with spinal cord injury: What fatigue?? *University of Illinois Graduate Research Forum*. Chicago, IL; Spring 2007.
- Choi HJ, **Thompson CK**, and Mark LS. Scaling affordances for human reach actions. *Steve Hinkel Memorial Student Forum*. Oxford, OH; Spring 2004.