

MOLLY B. JOHNSON, M.AmSAT, PhD

Southwestern University
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CURRENT POSITIONS

Assistant Professor, Kinesiology Department, Southwestern University, Georgetown, TX

- Teach Motor Control and Motor Learning classes and labs

Alexander Technique Instructor / Shaw Method Swimming Instructor / Owner, Integrated Motion Studio

- Provide private and group lessons in cognitive-motor re-education for music, dance, and athletic performance; posture; pain management; and injury prevention
- Provide private and group adult lessons in therapeutic aquatics and Alexander technique-based swimming

POSTDOCTORAL EXPERIENCE

Postdoctoral Research Fellow, Washington University, St. Louis, MO 2010 – 2011 (Joint appointment)

Movement Science Program
Program in Physical Therapy
Mentor: Dr. Linda Van Dillen

Occupational Health & Safety Research Group
Department of General Medical Science
Mentor: Dr. Bradley Evanoff

EDUCATION

Ph.D., Neuroscience and Behavior, 2010

University of Massachusetts, Amherst, MA
Advisor: Dr. Richard Van Emmerik

B.A. Biochemistry, 1998

Carleton College, Northfield, MN
Sigma Xi, Cum Laude

AmSAT-certified Alexander Technique Instructor, 2001

Dimon Institute, Somerville, MA (3-year, 1600 hour program)

TEACHING INTERESTS

- Motor Control
- Motor Learning
- Kinesiology
- Research Methods
- Writing
- Research in Kinesiology
- Neuroscience
- Movement Analysis
- Movement Disorders
- Complementary and Alternative Therapies
- Applied Human Anatomy

ACADEMIC TEACHING EXPERIENCE

2013–present Instructor, Informal Classes, University of Texas, Austin, TX

Alexander Technique and Swimming – Sole responsibility for lectures and course development

2004–2009 Supervisor, Kinesiology Department, University of Massachusetts, Amherst, MA

Supervised 10 Undergraduate Research Assistants – Data collection, analysis, writing

2006–2009 Teaching Associate, Psychology Department, University of Massachusetts, Amherst, MA

Writing Seminar - Sole responsibility for lectures, grading, and development of course materials

2003–2006 Teaching Assistant, Psychology Department, University of Massachusetts, Amherst, MA

Research Methods Seminar - Sole responsibility for lectures and grading

2001–2009 Training Course Assistant Faculty, Alexander Technique Training Center, Newton, MA

Functional Anatomy Course - Sole responsibility for lectures and course material

Alexander Technique Teacher Training - Assisted in 3-year training for Alexander certification

OTHER RELEVANT PROFESSIONAL EXPERIENCE

- 2011–present** **Research Consultant**, Assessment Resource Center, University of Missouri, Columbia, MO
Perform program evaluations for grant-funded projects, analyzing data and writing final evaluation reports used to set future program and funding goals
- 2014–present** **Fitness Instructor**, Atria Retirement Community, Austin, TX
Posture, Balance, and Mobility - Sole responsibility for course development and teaching of Alexander technique-based class; substitute for various elderly fitness and movement classes
- 1999–2003** **Personal Fitness Trainer**, Healthworks, Boston, MA
Developed programming and provided exercise training for fitness and injury prevention
- 1998–1999** **Lifeguard & Swimming Instructor**, Red Cross, Charlottesville, VA
Monitored pool for risky swimming behavior and emergencies and taught swimming lessons
- 1996–1998** **Student Athletic Trainer**, Carleton College, Northfield, MA
Provided first aid and injury management for college football and wrestling teams
- 1994–1995** **Job Coach**, Career Awareness Related Experience, Columbia, MO
Provided job training and mediation to caseload of at-risk youth; taught life skills classes

RESEARCH INTERESTS

I aim to develop an interdisciplinary research approach that links basic motor control, cognitive factors, and voluntary health behavior to the development of musculoskeletal pain, with implications for furthering our understanding of approaches to injury prevention and rehabilitation. I am also interested in how posture and movement are related to performance of daily activities, occupational health, fitness, and performing arts.

My doctoral research demonstrated that healthy people can voluntarily adopt movement patterns that interfere with posture and coordination. In particular, my research suggested that the postural relationship of the head to the trunk influences postural stability and coordination of the body during movement transitions. My postdoctoral research built on these findings by assessing whether healthy people who develop low back pain during prolonged standing habitually adopt movement patterns associated with clinical low back pain. This research attempts to demonstrate that there are postural and movement patterns common in a healthy population that predisposes them to the development of low back pain. Together, my research aims to demonstrate that postural control and movement patterns have a potential impact on basic motor performance, postural stability, and injury risk. A greater understanding of the connection between movement patterns, cognitive factors, and musculoskeletal pain could greatly facilitate rehabilitation and preventative interventions and could enhance our ability to train high-level athletes, musicians, and others whose performance depends on complex motor and cognitive control.

RESEARCH EXPERIENCE

Research Collaboration, University of Idaho, Moscow, ID, 2010–present

In collaboration with Rajal Cohen, M.AmSAT, PhD, I collected pilot data on the impact of the Alexander technique on stance, gait, and gait initiation. I have co-authored one grant proposal to complete the project and am assisting with proposals for future research addressing cognitive factors involved in forward head posture in occupational environments. We are also developing methods to assess differences in executive functioning, inhibition, and motor performance between Alexander teachers, healthy controls, and people with neurological disorders.

Postdoctoral Research Fellow, Washington University School of Medicine, St. Louis, MO, 2010–2011

Mentored by Bradley Evanoff, MD, MPH, as part of a study on participatory ergonomic interventions for carpenters, I developed methods to assess muscle activity with EMG and joint motion using goniometers at worksites and identified work tasks and body positions that pose the greatest exposure and potential injury risk.

Postdoctoral Research Fellow, Washington University School of Medicine, St. Louis, MO, 2010–2011

Mentored by Linda Van Dillen, PT, PhD, as part of a clinical trial of classification-specific physical therapy treatment for low back pain, I analyzed data and prepared manuscripts on differences in motor characteristics on clinical tests of trunk and limb movements between genders, subgroups of people with low back pain, and treatment groups. I also developed methods for collecting and analyzing data on motor characteristics and psychosocial factors in people who do and do not develop low back pain during prolonged standing and am assisting with manuscript preparation and publication.

PhD Dissertation, University of Massachusetts, Amherst, MA, 2006–2009

My dissertation research was advised by Richard Van Emmerik, PhD. The goal was to assess how adopting different head orientations would impact postural stability during upright standing and lean and impact postural stability, movement characteristics, and multi-segmental torso coordination during a postural transition task in healthy people. These studies demonstrated that head extension impairs postural stability and leads to sit-to-stand strategy changes that may interfere with coordination. My published findings suggest that motor characteristics are related to voluntarily adopted head postures.

Research Collaboration, University of Massachusetts, Amherst, MA, 2008

In collaboration with the Communications Disorders Department, I mentored an Alexander technique colleague in the collection of pilot data on the impact of Alexander lessons on vocal production in healthy and vocally impaired people. My experience highlighted data analysis methods used for audio signals that could be useful for future research on how vocal and instrumental performance are related to motor characteristics.

Research Assistant, University of Massachusetts, Amherst, MA, 2008

Under the advisement of Joseph Hamill, PhD, I studied lower extremity muscle activation patterns during prolonged standing with different shoe insoles. I collected data, analyzed the spectral density of EMG signals, and wrote a report of the results to submit to the insole company.

Research Assistant, University of Massachusetts, Amherst, MA, 2007-2008

In collaboration with fellow students, under the advisement of Richard Van Emmerik, PhD, I studied respiratory flow, full-body kinematics, and postural sway under conditions that challenged breathing or systematically varied periodic arm motions or rotational motions of the torso. I collected data and developed MATLAB programs to analyze the periodic coherence between breathing flow rate, center of pressure, and body motion.

Major Research Project, University of Massachusetts, Amherst, MA, 2003-2006

My major research project was advised by Richard Van Emmerik, PhD. I studied movement patterns between multiple segments of the trunk during the sit-to-stand task in young, healthy people. I developed a 6-segment 3-D kinematic torso model in Visual 3D to study torso motion. My published findings suggest this model was useful for identifying different coordination patterns between regions of the trunk using cross-correlation analyses and showed a high degree of variability common in movement patterns.

Research Assistant, University of Massachusetts, Amherst, MA, 2005

In collaboration with fellow students, under the advisement of Richard Van Emmerik, PhD, I studied postural stability in women with Multiple Sclerosis (MS). I collected kinematic and ground reaction force data and assisted with data analysis and manuscript writing. Results suggest that women with MS adopt motor strategies that limit instability.

PEER-REVIEWED MANUSCRIPTS – PUBLISHED

- Sorensen, C.J., **Johnson, M.B.**, Norton, B.J., Callaghan, J.P., Van Dillen, L.R. Asymmetry of lumbopelvic movement patterns during active hip abduction is a risk factor for low back pain development during standing. *Motor Control*, in review.
- Sorensen, C.J., **Johnson, M.B.**, Callaghan, J.P., George, S.Z., Van Dillen, L.R. 2014. Validity of a paradigm for low back pain symptom development during prolonged standing. *The Clinical Journal of Pain*, 31:7, p. 652-659.
- Hoffman, S.L., **Johnson, M.B.**, Zou, D., Van Dillen, L.R. 2012. Gender differences in modifying lumbopelvic movement patterns during hip medial rotation in people with low back pain. *Rehabilitation Research and Practice*, p. 1-7.
- Hoffman, S.L., **Johnson, M.B.**, Zou, D., Van Dillen, L.R. 2012. Differences in end range lumbar flexion during slumped sitting and forward bending between low back pain subgroups and genders., *Manual Therapy*, 17:2, p. 157-163.
- Johnson, M.B.**, Hamill, J., Van Emmerik, R.E.A. 2012. Effect of head orientation on postural control during upright stance and forward lean, *Motor Control*, 16:1, p. 81-93.
- Johnson, M.B.**, Van Emmerik, R.E.A. 2011. Is head-on-trunk extension a proprioceptive mediator of postural control and sit-to-stand movement characteristics? *Journal of Motor Behavior*, 43:6, p. 491-498.
- Hoffman, S.L., **Johnson, M.B.**, Zou, D., Van Dillen, L.R. 2011. Sex differences in lumbopelvic movement patterns during hip medial rotation in people with chronic low back pain. *Archives of Physical Medicine and Rehabilitation*, 92:7, p. 1053-1059.
- Hoffman, S.L., **Johnson, M.B.**, Zou, D., Harris-Hayes, M., Van Dillen, L.R. 2011. Effect of classification-specific treatment on lumbopelvic motion during hip rotation in people with low back pain. *Manual Therapy*, 16:4, p. 344-350.
- Van Emmerik, R.E.A., Remelius, J.G., **Johnson, M.B.**, Chung, L.H., Kent-Braun, J.A. 2010. Postural control in women with multiple sclerosis: effects of task, vision and symptomatic fatigue. *Gait & Posture*, 32, p. 608-614.
- Johnson, M.B.**, Van Emmerik, R.E.A. 2010. The impact of head orientation on multi-segmental torso coordination during the transition from sitting to standing. *Proceedings of the Human Factors and Ergonomics Society Meeting*, 54:19, p. 1373-1377.
- Johnson, M.B.**, Cacciatore, T.W., Hamill, J., Van Emmerik, R.E.A. 2010. Multi-segmental torso coordination during the transition from sitting to standing. *Clinical Biomechanics*, 25, p. 199-205.

ABSTRACTS - PUBLISHED

- Cohen, R.G., **Johnson, M.B.**, Mancini, M., Horak, F.B. 2012. Differences in postural sway and gait initiation associated with long-term practice of the Alexander technique in healthy older adults and with brief instruction in the Alexander technique in subjects with Parkinson's disease. *International Society for Posture & Gait Research Proceedings*, p. 353, Trondheim, Norway.
- Sorensen C.J., **Johnson M.B.**, George S.Z., Callaghan J.P., Van Dillen L.R. 2012. The relationship between psychological factors and low back pain symptom intensity during prolonged standing in back-healthy people: a preliminary study. *The Spine Journal*, 12, p.31S.
- Johnson, M.B.**, Hoffman, S.L., Sorensen, C.J., Zou, D., Van Dillen, L.R. 2011. Does classification-specific treatment for low back pain improve lumbopelvic motion during untrained movement? *Medicine and Science in Sports and Exercise*, 43:5 Supplement, Denver, CO.

- Johnson, M.B.**, Van Emmerik, R.E.A., Cacciatore, T.W. 2007. Inter-segmental torso motion during the sit-to-stand task. *International Society for Posture & Gait Research Proceedings*. p. 167, Burlington, VT.
- Remelius, J.G., Chung, L.H., **Johnson, M.B.**, Smith, B., Baquis, G., Kent-Braun, J.A., Van Emmerik, R.E.A. 2007. Postural control in multiple sclerosis during reach and lean perturbations. *International Society for Posture & Gait Research Proceedings*, p. 144, Burlington, VT.
- Johnson, M.B.**, Mohrig, J. 1997. The effect of pH on the stereoselectivity of H-D exchange on malic acid and addition of D₂O to fumaric acid. *National Meeting and Exposition of the American Chemical Society Proceedings*, San Francisco, CA.

CONFERENCE PRESENTATIONS

- Johnson, M.B.**, Cohen, R.G. 2015. Clarifying the scientific foundations of the Alexander technique. *American Society for the Alexander Technique Annual Conference and General Meeting*, Boston, MA.
- Sorensen, C.J., **Johnson, M.B.**, George, S., Van Dillen, L.R. 2012. Validity of a model for low back pain symptom development during prolonged standing. *American Physical Therapy Association Combined Sections Meeting*, Chicago, IL.
- Dale, A.D., Jaegers, L., **Johnson, M.B.**, Evanoff, B. 2011. Task-based measurements to evaluate effectiveness of interventions in participatory ergonomic programs. *National Occupational Injury Research Symposium*, Morgantown, WV.
- Cohen, R.G., **Johnson, M.B.**, Mancini, M., Priest, K.C., Horak, F.B. 2011. Differences in postural control and gait coordination associated with long-term practice of the Alexander technique and Parkinson's Disease. *American Society for the Alexander Technique Annual Conference and General Meeting*, Las Vegas, NV.
- Cohen, R.G., **Johnson, M.B.**, Mancini, M., Horak, F.B. 2011. Changes in coordination associated with long-term practice of the Alexander technique are opposite those associated with Parkinson's disease. *Symposium for Portland Area Research on Complementary and Alternative Medicine*, Portland, OR.
- Johnson, M.B.**, Van Emmerik, R.E.A. 2011. Impact of head orientation on postural control during stance. *Translational Neuroscience Symposium*, University of Missouri, Columbia, MO.
- Rootberg, R., **Johnson, M.B.**, Andrianopoulos, M. 2009. The Alexander technique as an asset to vocal therapy as measured through standard voice science methods: a pilot study. *Annual Voice Foundation*. Philadelphia, PA.
- Johnson, M.B.**, Remelius, J.G., Van Emmerik, R.E.A., Hamill, J. 2005. Limb loading asymmetries and center of pressure variability during standing. *International Conference on Progress in Motor Control*, State College, PA.
- Remelius, J.G., Chung, L.H., **Johnson, M.B.**, Smith, B., Baquis, G., Kent-Braun, J.A., Van Emmerik, R.E.A. 2005. Postural control in women with Multiple Sclerosis. *American College of Sports Medicine*, Nashville, TN.
- Johnson, M.B.**, Remelius, J.G., Van Emmerik, R.E.A., Hamill, J. 2004. Postural asymmetries during quiet and unconstrained standing. *Conference for the Canadian Society for Biomechanics*, Halifax, Nova Scotia, Canada.

DISSERTATION AND NON-PEER REVIEWED PUBLICATIONS

- Johnson, M.B.**, Cohen, R.G., Quayle, L. 2015. Clarifying the scientific foundations of the Alexander technique. *American Society for the Alexander Technique Journal*, submission accepted for publication.
- Johnson, M.B.** 2010. Effect of head orientation on dynamic postural stability and torso coordination. *Electronic Doctoral Dissertations for University of Massachusetts*, Amherst, MA. Paper AAI3397711.
- Fader, S.L., **Johnson, M.B.** Winter 2006. Alexander technique and Parkinson's. *Parkinson's Report*, XII:1, p. 18.

GRANT SUBMISSIONS

North American Spine Society, Nontraditional, Nonsurgical Treatment Grant Letter of Proposal, 2011

- Impact of the Alexander technique on disc-related and/or neuropathic low back pain

NIH NRSA Postdoctoral Fellowship Submission, 2010

- Motor characteristics as a risk factor for low back pain during prolonged standing

Aquasphere Corporate Sponsorship Grant Proposal Submission, 2008

- Impact of Alexander technique - Shaw method of swimming instruction on back pain and swimming performance

NIH NRSA Predoctoral Fellowship Submission, 2006

- Effect of head orientation on dynamic postural stability and torso coordination

Carleton College Dean of Students' Independent Research Fellowship (awarded), 1997

- Application of the Alexander technique to motor learning and dance performance

ACADEMIC SERVICE ACTIVITIES

2010-2011 Program Innovation Council Member, Program in Physical Therapy, Washington University

2010-2011 St. Louis Movement Science Postdoctoral Group Vice President

2008-2009 Neuroscience & Behavior Program Colloquium Series Committee, University of Massachusetts

2005-2006 Biomechanics and Motor Control Journal Club Student Coordinator, University of Massachusetts

2004-2005 Translating Research in Exercise Science Lab Outreach Coordinator, University of Massachusetts

ACADEMIC HONORS

1997 Dean of Students' Independent Research Fellow, Carleton College

1996 Awarded Chemistry Department Research Internship, Carleton College

1993 Commended National Merit Scholar

PROFESSIONAL SERVICE ACTIVITIES

Since 2014 Austin Area Alexander Technique Founding Member

2011-2012 American Society for the Alexander Technique Research Grant Review Committee

2002-2003 American Society for the Alexander Technique Annual General Meeting Policy Committee Chair

2001-2002 American Society for the Alexander Technique Annual General Meeting Conference Coordinator

OTHER ACTIVITIES AND HONORS

2015 North Austin Community Garden Member, North Austin YMCA

1997-1998 Semaphore Dance Company Student Director, Choreographer, and Dancer, Carleton College

1993-1994 Rotary International Exchange Scholar, Thailand

1990-present Performing Musician: Banjo, Guitar, Mandolin, and Voice

MEMBERSHIPS IN PROFESSIONAL SOCIETIES

- International Society for Posture & Gait Research
- Human Factors and Ergonomics Society
- Canadian Biomechanics Society
- International Society of Motor Control
- Canadian Society for Psychomotor Learning and Sport Psychology
- American Society for the Alexander Technique
- Austin Area Alexander Technique
- Register of Shaw Method Teachers
- American Council on Exercise
- Austin Friends of Traditional Music
- Central Texas Bluegrass Association

REFERENCES

Rajal Cohen, M.AmSAT, PhD
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