

CURRICULUM VITAE

NAME: Susan Holly Curwin Brown

PLACE OF BIRTH: Windsor, Nova Scotia, Canada

ACADEMIC DEGREES:

1972-1976 Acadia University, Wolfville, Nova Scotia
B.Sc. Biology (Honours)

1977-1979 University of Western Ontario, London, Ontario, Canada
M.Sc. Physiology *Movement-Related EMG Activity in Humans*

1981-1986 University of Western Ontario, London, Ontario, Canada
Ph.D. Physiology *Control of Movement Initiation in Humans*

EMPLOYMENT:

1979-1981 Research Assistant, Dept. of Physiology, Univ. Western Ontario

1986-1987 Research Associate, Dept. of Physiology, Univ. Western Ontario

1987-1989 Post-doctoral Research Fellow, Dept. of Neurology, Univ. Duesseldorf, Germany

1989-1990 Research Associate, Dept. of Neurology, Univ. Western Ontario

1991-1992 Research Associate, Faculty of Applied Health Sciences, Univ. Western Ontario

1992-1998 Assistant Professor, Division of Kinesiology, Univ. Michigan

1998- present Associate Professor, Division of Kinesiology, Univ. Michigan

1999-2000 Associate Director for Research, Division of Kinesiology, Univ. Michigan

2000- 2006 Associate Dean for Research, Division of Kinesiology, Univ. Michigan

RELATED CLINICAL EXPERIENCE:

1990-1991 Combined courses, field work in Physical Therapy, Univ. Western Ontario

HONORS AND AWARDS (post graduate):

1987-1989 Alexander von Humboldt Fellowship, Germany

1991-1992 Ontario Ministry of Health Fellowship

1996 Teaching Excellence Award, Division of Kinesiology, University of Michigan

1997 Career Development Award for Women Faculty, University of Michigan

 Teaching Excellence Award, Division of Kinesiology, University of Michigan

2001 University of Michigan Thurnau Professorship for Excellence in Undergraduate Teaching

2002 St. Thomas University Visiting Chair Professorship in Gerontology (Fredericton, New Brunswick, Canada)

2004 UM Elizabeth Crosby National Science Foundation ADVANCE Award

PROFESSIONAL MEMBERSHIPS:

1978- present Society for Neuroscience

1998- present International Movement Disorders Society

1998- present Gerontological Society of America

SERVICE (RESEARCH):

1993-2000 Co-organizer - Center for Human Motor Research Seminar Series, Division of Kinesiology

1993-1998 Founder - Kinesiology Day (annual one-day meeting to showcase multi-disciplinary activities within the Division of Kinesiology)

1991- present of Manuscript Reviewer for: Brain, Brain Research, Experimental Brain Research, Journal Motor Behavior, Journal of Neurophysiology, Motor Control, Journal of Gerontology, Neuropsychology, Journal of Hand Therapy

2000-present Grant Reviewer for Canada Foundation for Innovation, Medical Research Council of Canada, Fonds de Recherche sur la Nature et les Technologies Quebec, Sick Children's Hospital

2006-2007 NIH Taskforce on Childhood Motor Disorders

2006 NIH reviewer: ZRG1 BBBP-E (02) Motor Dysfunction, Learning, and Voice

2007 workshop organizer (Adults with Cerebral Palsy) American Academy of Cerebral Palsy and Developmental Medicine

2007 Editorial Board Member, Motor Control Journal

SERVICE (UNIVERSITY):

1999 – 2006 Research Associate Deans Group, University of Michigan

2001 – 2007 Provost's Council on Student Honors
Senate Assembly Tenure Committee
University of Michigan Initiative on Disability Studies Steering Committee

2002- 2007 University of Michigan Shipman Scholars Society faculty advisor

2002 University of Michigan President's Council on Undergraduate Education

2003 – 2004 Center for Research on Learning and Teaching Faculty Advisory Committee

2004- 2007 Provost's Student Honors Sub-Committee for Rhodes, Mitchell, Marshall nominees

2005- 2007 University of Michigan NIH- Clinical and Translational Science Award proposal working committee, CTSA institutional support, community engagement subcommittees)

2005-present UM Multidisciplinary Clinical Researchers in Training (MCRiT) Advisory Committee

2006 UROP/Women in Science invited seminar speaker

2006 UM Biomedical Research Council grant reviewer

2007-2010 Rackham Graduate School Barbour Scholarship Selection committee

2007-2008 CTSA scientific advisory committee and internal grant reviewer

SERVICE (KINESIOLOGY):

1993-1996 Kinesiology Day Committee (chair, committee member)

1994-1995 Kinesiology K-Quality Committee - Ph.D. review (member)
Martin Luther King Day panel discussion, Kinesiology (co-moderator)
Planning Committee - Joint Ph.D. Program between Dept. of Physical Therapy and Division of Kinesiology (Kinesiology representative)

1994-1998 Graduate Committee (member)

1996-1997 Learning Environment Advisory Committee (member)
Faculty Search Committee (member)

1996-1998 Executive Committee (member)

1997-1998 UM Provost Grant Governing Team (member)
Kinesiology Dean Search Committee (member)
Awards Committee (member)

1998-1999 Chair, Movement Science Curricular Unit
Faculty Search Committee (member)
Systems Administrator Search Committee (member)

1999-2000 Chair, Graduate Committee
Coordinator, Kinesiology Minority Undergraduate Student Initiative

1999-2006 Associate Dean for Research

2000-2002 Chair, Senior Faculty Search Committee

2000-present Coordinator, Kinesiology Seminar Series

2002-2006 Awards Committee

2004- present Technology Committee

2005-2006 Lecturer Search Committee (member)

2007- Kinesiology Endowed Professorship Search Committee (co-chair)

SERVICE (COMMUNITY) (1992-):

1993-1994	Washtenaw County Intermediate School Board - Females in Technology Program Site Visit Coordinator and Host
1994	Angell School, Ann Arbor - Grade 4 Laboratory Site Visit
1995	Washtenaw County Parkinson Support Group - Board of Directors presentation
1997	Coordinator for summer presentation series to Parkinson support group
1997-present	Technical Expert - Technical Advisory Service for Attorneys
1997-present	Speaker - Parkinson Support Groups in southeastern Michigan
2000-2002	Ann Arbor Exercise and Mobility Program for Individuals with Parkinson's Disease – coordinator
2004	Local radio interview (WAAM) – aging and physical activity
2004 -2005	Coordinator for service learning wellness project – Ann Arbor Center for Independent Living and Division of Kinesiology collaboration
2006	City of Ann Arbor Science Safari presenter

RESEARCH GRANTS (funded):

1992-1994	Univ. Western Ontario Academic Development Fund, \$50,000 <i>Development of a Portable Unit for Testing of Movement Function</i> co-investigator
1993	OVPR small projects grant, Univ. Michigan, \$1,200 Support for Dr. M.Thaut (visiting scholar)
1993-1994	Rackham Faculty Grant, Univ. Michigan, \$14,700 <i>Auditory Facilitation of Upper Limb Movements</i> principal investigator
1995	National Parkinson Foundation \$2,200 <i>Role of Auditory Cueing in Assisting Movement In Parkinson's Disease</i> Summer Graduate Research Fellowship for T. Liberzon, doctoral student)
1995	Washtenaw County Parkinson Support Group \$1,200 <i>Role of Auditory Cueing in Assisting Movement in Parkinson's Disease</i> Graduate Student Support
1996	National Institute of Aging FIRST Award \$498,477 <i>Facilitation of Motor Function Through Sensory Cueing</i> principal investigator (09/96-08/01)
1996	National Parkinson Foundation \$2,200 <i>Role of Auditory Cueing in Facilitating Limb-Posture Coordination in Parkinson's Disease</i> Summer Graduate Research Fellowship for T. Liberzon, doctoral student)
1996	National Institute for Disability and Rehabilitation Research \$348,000 <i>Treatment of Upper Extremity Spasticity with Botulinum Toxin: Motor Control Evaluation to Determine Efficacy</i> co-principal investigator (09/96-08/99)
1996	National Institutes of Health \$1,213,420 University of Michigan Medical Rehabilitation Research Training Program, Dept. of Physical Medicine and Rehabilitation

- (participating investigator) 07/96 - 06/01
- 1996 RCMI Clinical Research Center Pilot Project - Univ. Puerto Rico \$20,000
Quantitative Assessment of Upper Limb Function in Children with Myelodysplasia
(co-principal investigator with Dr. Edwardo Ramos, Univ. of Puerto Rico)
12/96-12/97
- 1996 Office of the Vice - President for Research and the Rackham Graduate School \$1,000
Computer Applications in Rehabilitation Workshop, London, Ontario
- 1997 Rackham Spring/Summer Research Grant \$2,000
Bilateral Force Control in the Elderly
(support for G. Conti, doctoral student)
- 1999 University of Michigan Career Development Fund for Women Faculty \$5,000
- 2000 National Center for Medical Rehabilitation Research – Centers of Excellence Programs
Restoration of Function in Neurologic Impairment – A Research Development Program
network scientist participating member (P.I. Dr. Z. Rymer, Rehabilitation Institute of
Chicago)
- National Institute for Disability and Rehabilitation Research \$449,816
*Repetitive Intensive Training Exercise: Effect on Upper Extremity Motor Function in S
Spasticity*
co-principal investigator, (PI - Dr. E. Hurvitz, Dept. of Physical Medicine and
Rehabilitation) (09/00-08/03)
- Michigan Parkinson's Foundation \$1,500
Development of an exercise intervention program for Parkinson's Disease
- University of Michigan Summer Research Undergraduate Opportunity (SROP)
Biomedical Fellowship (H. Feldhusen, undergraduate Kinesiology student) \$3,500
- UM Medical Rehabilitation Research Training Program (NIH T32) \$1,730,630 (5yr)
Bridging Science into Service
Assessment of Motor Performance Core Co-Director
- UM SROP Biomedical Fellowship (M.Bui, LSA) \$3500
- 2002 UM South Africa Initiatives Office \$5,000
*Effects of Malnutrition on Motor Performance in Preadolescence and Adolescence in
Rural South Africa* principal investigator
- UM Graduate School \$5,000
Effects of Malnutrition on Motor Performance in South African Children
principal investigator
- UM Mott Children's Hospital \$28,000
Bilateral Coordination in Children with Unilateral Upper Limb Impairment
co-principal investigator (PI: E. Hurvitz)
- Preparation of Leadership Personnel Training Grant, U.S. Dept of Education \$793,000
Core faculty member providing pediatric research opportunities - funding for trainees only
(09/02-09/07)

- 2003 UM SROP Biomedical Fellowship \$3500 (S. Huang, Engineering)
- UM Office of the Vice President for Research \$5780.00
Auditory Facilitation of Limb-Posture Coordination in Healthy Aging and Parkinson's Disease principal investigator
- 2004 UM Elizabeth Crosby NSF Advance Award \$20,000
Limb-Posture Control and Proprioceptive Function in the Elderly
principal investigator
- 2005 National Institutes of Health R03 \$150,000
Age-related Changes in Upper Limb Proprioceptive Acuity
principal investigator (08/05-07/07)
- Weikert Family Foundation \$30,000
Movement and Music Program to Enhance Elementary School Learning, Motor Coordination and Health Attitudes – Planning Grant (2005-2006)
principal investigator
- National Institute on Disability Rehabilitation and Research \$450,000
Sensorimotor Training and Assessment in Adults with Hemiplegic Cerebral Palsy: The ULTrA Program
principal investigator (12/05-11/08)
- UM SROP Biomedical Fellowship \$3500 (C. Waechter, Kinesiology)
- UM Center for the Education of Women Reicher Scholarship for Undergraduate Research
\$2,000
- 2006 UM Digital Media Commons GROCs program \$1500
ACE for Art: Adapted Computer Environment for Online Art Workshop
faculty advisor
- 2007 National Institute on Disability Rehabilitation and Research \$500,000
Home- and Internet-Based Sensorimotor Training in Adults with Hemiplegic Cerebral Palsy: A Multi-Site Study of the Effectiveness of Project ULTrA
Principal investigator (09/08-08/11) pending

RESEARCH PUBLICATIONS (refereed journals):

1. **Brown, S.H.C.**, Cooke, J.D. Amplitude-and instruction-dependent modulation of movement-related EMG activity in humans. *J. Physiol.* 316: 97-107, 1981a.
2. **Brown, S.H.**, Cooke, J.D. Compensation for force perturbation preceding voluntary human arm movements. *Brain Res.* 220: 350-355, 1981b.
3. **Brown, S.H.**, Cooke, J.D. Initial agonist burst duration depends on movement amplitude. *Exp. Brain Res.* 55: 523-527, 1984.

4. Cooke, J.D., **Brown, S.H.** Science and statistics in motor physiology. *J. Mot. Behav.* 17: 489-192, 1985.
5. Cooke, J.D., **Brown, S.H.**, Forget, R., Lamarre, Y. Initial agonist burst duration changes with movement amplitude in a deafferented patient. *Exp. Brain Res.* 60: 184-187, 1985.
6. **Brown, S.H.**, Cooke, J.D. Magnitude of the initial agonist burst is modified by perturbations preceding movement. *Brain Res.* 377: 311-322, 1986a.
7. **Brown, S.H.**, Cooke, J.D. Movement-related EMG activity compensates for position-dependent changes in limb properties. *J. Hum. Mov. Studies.* 12: 297-312, 1986b.
8. Cooke, J.D., **Brown, S.H.** Phase-plane tracking; a new method for shaping movements. *Behav. Brain Bull.* 16: 435-437, 1986.
9. Cooke, J.D., **Brown, S.H.**, Cunningham, D.A. Kinematics of arm movements in elderly humans. *Neurobiol. Aging.* 10: 150-165, 1989.
10. Darling, W.G., Cooke, J.D., **Brown, S.H.** Control of simple arm movements in elderly humans. *Neurobiol. Aging.* 10: 139-149, 1989.
11. **Brown, S.H.**, Cooke, J.D. Movement-related phasic muscle activation: I. Relations with temporal profile of movement. *J. Neurophysiol.* 63: 455-464, 1990.
12. **Brown, S.H.**, Hefter, H., Mertens, M., Freund, H.-J. Disturbances in movement trajectory due to cerebellar dysfunction. *J. Neurol. Neurosurg. Psychiat.* 53: 306-313, 1990.
13. Cooke, J.D., **Brown, S.H.** Movement-related phasic muscle activation: II. Generation and functional role of the "triphasic" pattern. *J. Neurophysiol.* 63: 465-472, 1990.
14. **Brown, S.H.**, Hefter, H., Cooke, J.D., Freund, H.-J. Preferential impairment of slow and fast alternating movements in patients with mild cerebellar ataxia. *J. Neurol. Neurosurg. Psychiat.* 56: 1038-1039, 1993.
15. **Brown, S.H.**, Kessler, K., Hefter, H., Cooke, J.D., Freund, H.-J. Role of the cerebellum in visuomotor coordination I. Delayed eye and arm initiation in patients with mild cerebellar ataxia. *Exp. Brain Res.* 94: 478-488, 1993.
16. Cooke, J.D., **Brown, S.H.** Movement-related phasic muscle activation: III. Control of the duration of phasic agonist activity. *Exp. Brain Res.* 99: 473-482, 1994.
17. Virji-Babul, N., Cooke, J.D., **Brown, S.H.** Effects of gravitational forces on single joint arm movements in humans. *Exp. Brain Res.* 99: 338-346, 1994.
18. Cooke, J.D., Hefter, H., **Brown, S.H.**, Toyka, K., Freund, H.-J. Kinematic and EMG analysis of motor dysfunction associated with Lambert-Eaton Syndrome. *Electromyogr. Clin. Neurophysiol.* 34: 87-93, 1994.
19. **Brown, S.H.** Kinematics of arm movements in the elderly. *in Advances in Psychology*, Teasdale, N. and Ferrandez, A.-M. (eds). Elsevier, pg. 27-52, 1996.
20. Hefter, H., **Brown, S.H.**, Cooke, J.D., Freund, H.-J. Basal ganglia and cerebellar impairment differentially affect the amplitude and time scaling during the performance of forearm step tracking movements. *Electromyogr. Clin. Neurophysiol.* 36: 1-8, 1996.

21. Thaut, M.H., **Brown, S.H.**, Benjamin, J., Cooke, J.D. Rhythmic facilitation of movement sequencing: effects on spatiotemporal control and sensory modality dependence. *MusicMedicine*, 2: 104-113, 1996.
22. Thaut, M.H., **Brown, S.H.**, McIntosh, G., Rice, R. Effects of rhythmic auditory cueing on gait characteristics in Parkinson's patients. *J. Neurol. Neurosurg. Psychiatr.* 36:47-54, 1996.
23. Hefter, H., Cooke, J.D., **Brown, S.H.**, Weiss, P., Kuhlman, H., Freund, H.-J. Kinematic properties of upper limb movement trajectories. in *Instrumental Methods and Scoring in Diagnosis and Quantification of Extrapramidal Disorders*. Pryzuntek, T., Korzin, Kraus (eds). Springer-Verlag, 1996.
24. Ramos, E., Latash, M., Hurvitz, E., **Brown, S.H.** Assessment of reaching movements in children with ataxia using kinematic analysis techniques. *Arch. Phys. Med. Rehab.* 78: 491-496, 1997.
25. Hurvitz, E.A., Flansburg, E.L., Conti, G.E., **Brown, S.H.** The use of motor control testing to evaluate response to Botulinum toxin injections in the upper extremity. *Arch Phys. Med. Rehab.* 79: 1177-, 1998.
26. Hurvitz, E.A., Conti, G.E., Flansburg, E.L., **Brown, S.H.** Quantitative evaluation of upper limb function following Botulinum toxin injection: a case report. *Arch. Phys. Med. Rehab* 81: 1408-1415, 2000.
27. Hurvitz, E.A., Conti, G.E., **Brown, S.H.** Changes in movement characteristics of the spastic upper following Botulinum toxin injection. *Arch Phys. Med. Rehab.* 84: 444-451, 2003.
28. Goble, D.J., Lewis, C.A., Hurvitz, E., **Brown, S.H.** Effects of age and task complexity on upper limb proprioceptive acuity in children. *Human Mov Sci.* 24: 155-170, 2005.
29. Goble, D.J., Lewis, C.A., **Brown, S.H.** Upper limb asymmetries in the accuracy of proprioceptively-guided limb movements. *Exp. Brain Res* 168: 307-311, 2006.
30. Adamo, D.A., Martin, B.J. **Brown, S.H.** Upper limb proprioceptive acuity in the elderly. *Percept Mot Skills* 104: 1297-1309, 2007
31. Goble, D.J. **Brown, S.H.** Task-dependent asymmetries in the utilization of proprioceptive feedback for goal-directed movement. *Exp. Brain Res.* 180 (4): 693-704, 2007
32. Goble, D.J., **Brown, S.H.** The biological and behavioural basis of upper limb asymmetries in sensorimotor performance. *Neurosci. Biobehav. Rev.* 32(3): 598-610, 2008

MANUSCRIPTS UNDER REVIEW:

1. Adamo, D.A., Alexander, N.B., **Brown, S.H.** The influence of age and physical activity on the ability to perform proprioceptively-guided movements. (*J. Aging Physical Activity*)
2. Goble, D.J., **Brown, S.H.** The left and right arms rely on different senses for targeted movement (*J. Neurophysiol*)
3. Adamo, D.A., Alexander, N. Brown, S.H. The influence of general and specific physical activity on upper extremity position matching in older adults: a methodological consideration. (*J. Am Occ. Ther*)
4. Goble, D.J., Lewis, C.A, Hurvitz, E.A, **Brown, S.H.** Proprioceptive deficits in children with hemiplegic cerebral palsy. (*Neurorehab Neural Repair*)

MANUSCRIPTS IN PREPARATION:

1. **Brown, S.H.**, Hurvitz, E.A., Conti.G.E. Effects of task-based training on upper limb function in children with hemiplegic cerebral palsy. (*Arch Phys. Med. Rehab*)
2. **Brown, S.H.**, Goble, D.J., Hurvitz, E.A. Quantitative assessment of upper limb function in children with congenital brachial plexus palsy. (*Ped Neurol*)

3. **Brown, S.H.**, Lewis, C.A., Hurvitz, E.A. The use of internet technology in delivering home-based motor training for adults with hemiplegic cerebral palsy. (Dis. Rehab).
4. Shafir, T., **Brown, S.H.** Control of timing of rhythmic arm movements (J. Mot Behav)
5. Adamo, D.E., **Brown, S.H.** Age-related asymmetries in the ability to reproduce grasp force. (Exp Brain Res)
6. Larson, C.L. **Brown, S.H.** Reaching kinematics in essential tremor (J. Neurol)
7. **Brown, S.H.**, Lewitt, P., Samczyk, N.L. Effects of sensory cueing on stopping a sequential task in Parkinson's Disease. Mov. Dis.
8. **Brown, S.H.**, Hurvitz, E.A., Conti, G.E., Samczyk, N.L. Short term motor training leads to improvement in upper limb function in children with hemiplegic cerebral palsy (Arch Phys Med Rehab)
9. Huang, M., **Brown, S.H.** Effects of sensory cueing on movement reversal times during rhythmic reaching movements in Parkinson's Disease (Mov. Disorders)
10. Huang, M., **Brown, S.H.** Limb-posture coordination during reaching from standing in elderly subjects (J. Gerontol)
11. Conti, G.E., **Brown, S.H.** Asymmetric grasp force production in older adults

RECENT CONFERENCE ABSTRACTS 2002-2007:

1. Liberzon, T., Brown, S.H. Impulse variability during multi-joint rhythmic arm movements. Proc. Soc. Neurosci. 28: 767.1, 2002
2. Huang, M., Brown, S.H. Sensory Facilitation of Movement Reversals in Parkinson's Disease. Proc. Soc. Neurosci. 28.566.2, 2002
3. Adamo, D.E., Martin, B.J., Brown, S.H.. Proprioceptive acuity in young and elderly adults. Proc Soc. Neurosci. 29: 7315.15, 2003
4. Conti, G.E., Brown, S.H. Grasp force modulation during bimanual tasks in young and elderly adults. Proc. Soc. Neurosci. 29: 2003
5. Goble, D.J., Conti, G.E., Samczyk, N.L., Hurvitz, E., Nelson, V.S., Brown, S.H. Bilateral upper limb coordination in children with brachial plexus injury. Proc. Soc. Neurosci. 29: 71.8, 2003
6. Huang, M., Huang, S., Brown, S.H. Effects of auditory cueing on sequential reach and grasp movements in elderly and Parkinson's Disease subjects. Proc. Soc. Neurosci. 29: 71.15, 2003
7. Larson, C.A., Brown, S.H. Postural tremor in persons with essential tremor. APTA conference, 2004
8. Goble, D.J., Chesney, J.D., Lewis, C.A., Brown, S.H. Limb asymmetries during passive but not active proprioceptive matching. Proc. Soc. Neurosci. 30: 871.14, 2004.
9. Lewis, C.A., Goble, D.J., Hurvitz, E.A., Brown, S.H. Proprioceptive acuity in children with mild spastic hemiparesis. Proc. Soc. Neurosci. 30: 181.7, 2004.
10. Adamo, D.E., Brown, S.H. Ipsilateral and contralateral matching of isometric grip force. Proc. Soc. Neurosci. 30: 653.11, 2004.
11. Huang, M., Penfold, M.M., Brown, S.H. Coordination of center of pressure excursion and hand path during sequential reaching in young and elderly subjects. Proc. Soc. Neurosci. 30: 873.3, 2004
12. Adamo, D.E., Brown, S.H. Upper Limb Proprioceptive Acuity in the Elderly: The Effects of Physical Activity and Hand Preference, Proc. Gerontological Society of America, 2005
13. Brown, S.H., Hurvitz, E.A., Conti, G.E., Samczyk, N.L. Improvement in Upper Limb Function in Children with Hemiplegic Cerebral Palsy Following a Six-Week Motor Training Intervention. AAPMR Meeting 2005 **(invited podium presentation)**
14. Brown, S.H., Hurvitz, E.A., Conti, G.E., Samczyk, N.L. Effects of Task-Based Training on Upper Limb Function in Hemiplegic Cerebral Palsy. American Congress of Rehabilitation Medicine 2006 **(invited podium presentation)**
15. Goble, D.J., Brown, S.H. Enhanced Limb Asymmetries during Active versus Passive Proprioceptive target Matching. Neural Control of Movement Conference, 2005
16. Goble, D.J., Brown, S.H. Limb Specific Differences in the Ability to Utilize Active versus Passive Proprioceptive Target Information. Progress in Motor Control Conference, 2005

17. Goble, DJ, Hurvitz, EA, Nelson, VS, Brown, SH Bilateral Facilitation of Upper Limb Movements in Children with Congenital Brachial Plexus Palsy. American Academy of Physical Medicine and Rehabilitation (AAPMR) 2005 **(invited podium presentation)**
18. Goble, DJ., Priebe, J., Brown, SH The Effects of Start Position on the Accuracy of Proprioceptively Guided Movements Proc. Soc. Neurosci: 31: 2005
19. Lewis, CA, Goble, DJ, Hurvitz, EA, Brown, SH Proprioceptive Acuity and Multi-joint Coordination in Hemiplegic Cerebral Palsy. American Congress Rehabilitation Medicine 2005
20. Lewis, CA, Goble, DJ, Hurvitz, EA, Brown, SH Sensorimotor Coordination in Children with Hemiplegic Cerebral Palsy. AAPMR 2005
21. Lewis, CA, Hurvitz, EA, Brown, SH. Assessment of Upper Limb Function in Adults with Hemiplegic Cerebral Palsy American Academy of Cerebral Palsy and Developmental Medicine 2006
23. Adamo, DA, Alexander, N., Brown, SH. Grasp Force Control in the Elderly: Effects of Physical Activity and Handedness. Proc. Gerontol. Society of America, 2006
24. Adamo, DA, Alexander, N., Brown, SH. The Influence of Age, Physical Activity and Hand Preference on the Ability to Utilize Force Feedback, Proc. Soc Neurosci. 32: 2006
25. Goble, DJ, Brown, SH. Asymmetries in the Accuracy of Matching Visual versus Proprioceptively-Determined Target Arm Positions. Proc Soc. Neurosci. 32: 2006 **(selected for International Press Book release)**
26. Waechter, C, Adamo, D. Brown, SH. Assessment of Sensorimotor Performance in the Elderly Using Clinical and Experimental Methods. Proc. Soc. Neurosci. 32: 2006
27. Seo, N., Brown, SH. Scaling of Safety Margins During Isometric Push Force Tasks. Proc. Soc. Neurosci. 32: 2006.
28. Lewis, CA, Hurvitz, EA, Brown, SH. Kinematic Analysis of Upper Limb Function in Adults with Hemiplegic Cerebral Palsy. Proc. International Federation of Adapted Physical Activity 2006.
29. Brown, SH, Lewis, CA, Turk, P, Hurvitz, EA. Adults with Cerebral Palsy: Health, Fitness and Motor Function. Instructional Course for American Academy of Cerebral Palsy and Developmental Medicine annual conference 2007
30. Adamo, DE, Brown, SH The influence of age and task demands on the ability to utilize proprioceptive feedback in right hand dominant individuals. Progress in Motor Control Conference 2007
31. Goble, DJ., Brown, SH. Non-preferred Arm Advantages in the Coordination of Static and Dynamic Proprioceptive Feedback. Progress in Motor Control Conference 2007
32. McCarthy, J. M., Lewis, C.A., Brown, S.H. Improvement in Sensorimotor Function in Adult Cerebral Palsy Using a Computer-Based Home Training Program (Project ULTrA). Progress in Motor Control Conference 2007
33. Wright, ML, Adamo, DE, Brown, SH. Age-Related Declines in the Perception of Upper Limb Movement and Grasp Force. Progress in Motor Control Conference 2007
34. Adamo, DE, Brown, SH. The Influence of Age, Physical Activity and Hand Preference on the Ability to use Position and Force Feedback. Festival of International Conferences on Caregiving, Disability, Aging and Technology, Toronto, CA 2007
35. Goble, DJ, Brown, SH. Movement accuracy during the matching of dynamic proprioceptive feedback. Proc Soc. Neurosci. 33: 2007
36. Brown, SH, Goble, DJ, Hurvitz, EA Hemispheric Asymmetries in the Ability to Utilize Position-Related Proprioceptive Feedback in Hemiplegic Cerebral Palsy. Neural Control of Movement Conference 2008
37. Brown, S, Lewis, C, McCarthy, J, Hurvitz, E Improvement in Arm and Hand Function in Adults with Hemiplegic Cerebral Palsy using Internet-based Home Training (Project ULTrA). Submitted to AACPDM
38. Brown, SH, Hurvitz, EA Improved Upper Limb Function in Adults with Cerebral Palsy Using Internet-Based Home Training (submitted to AAPMR)
39. Brown, S.H., Lewis, C.A., McCarthy, J.M., Hurvitz, E.A. Improved upper limb function in cerebral palsy using internet-based home training. (submitted to European Congress on Physical and Rehabilitation Medicine)

INVITED LECTURES:

- 1987 Modification of the Initial Agonist Burst by Peripheral Feedback. Neurol Klinik, Essen, Germany, May 25, 1987.
Role of Phasic EMG Activity in the Control of Movement Trajectory. Institute for Physical Biology, Univ. Duesseldorf, Germany, June 25, 1987.
- 1988 Control of Movement Trajectory in the Elderly. Nijmegen Brain and Behaviour
Colloquium, Univ.Nijmegen, Netherlands, June 20, 1988.
Role of the Cerebellum in the Control of Movement Trajectory. Dept. of Psychology, Univ. Cambridge, England, July 18, 1988.
- 1989 Phasic EMG Patterns in Human Arm Movements during Phase Plane Tracking.
Physiology Institute, Univ. Duesseldorf, Germany, June 28, 1989.
- 1990 Changes in Movement Strategy Due to Mild Cerebellar Dysfunction. Chicago
Rehabilitation Institute, Chicago, January 17, 1990.
A New Hypothesis for the Function of Movement-Related Phasic Muscle Activity. Division
of Kinesiology, Univ. Michigan, Ann Arbor, April 25, 1990.
- 1991 Current Concepts in the Control of Human Arm Movements. Dept. of Physical Therapy,
Univ. Western Ontario, London, Canada, January 22, 1991.
Control of Visually Guided Arm Movements in the Young and Elderly. Dept. of Clin.
Neurol Sci Univ. Western Ontario, London, Canada, May 10, 1991.
- 1992 Scaling of Movement Kinematics in the Elderly. NATO Advanced Workshop:
Sensorimotor Impairments in the Elderly. Bad Windsheim, Germany, Sept 12, 1992.
- 1993 Sensori-motor Function in Elderly Humans. International Society for Studies in
Behavioural Development, Recife, Brazil, July 14, 1993.
Current Issues in Human Motor Control. Dept. of Physical Medicine and Rehabilitation,
Univ. Michigan, Ann Arbor, Sept 2, 1993.
- 1994 Control of Voluntary Arm Movements in the Elderly and Preliminary Findings in DAT
Subjects. Washington Univ. School of Medicine, St. Louis, May 17, 1994.
- 1995 Control of Human Limb Movements. Dept. of Neurology, Univ. Duesseldorf, Duesseldorf,
Germany, March 29, 1995
Oculomanual Coordination in Patients with Cerebellar Ataxia. Faculty of Applied Health
Sciences, University of Western Ontario, May 8, 1995

Oculomanual Coordination in Patients with Lesions of the Cerebellum and Parietal
Cortex. Human Motor Control Satellite Symposium of the Fourth IBRO World Congress
of Neuroscience, Nara, Japan, July 8, 1995
- 1997 Kinematic Analysis in Movement Disorders. Dept. of Physical Medicine and Sports
Science, Univ. Puerto Rico May 16, 1997
- 1999 Application of Motor Control Principles in the Assessment of Upper Limb Movements:
Implications for Rehabilitation. Dept. of Biomedical Engineering, Orthopaedic Research
Seminar Series. Univ. Michigan June, 1999
- 2002 Sensory Facilitation of Movement in Parkinson's Disease. St. Joseph's Hospital, Dept of
Geriatrics Grand Rounds, St. John, New Brunswick, Canada, October, 2002
Physical Activity, Aging, and Parkinson's Disease: Training the Brain Through Movement
Creamer Lecture, St. Thomas University, Fredericton, Canada, November, 2002

- Mobility Issues in Older Adults and Parkinson's Disease. New Brunswick Community College, Program in Social Services, St. John, Canada. November, 2002
- 2006 Kinematic Analysis of Bilateral Coordination in Children with Congenital Brachial Plexus Palsy. Dept. of Physical Medicine and Rehabilitation, Univ. Michigan Medical Center, April 2006
- Effects of Aging, Hand Preference, and Physical Activity on Proprioceptive Ability. Beijing Sport University, May 2006
- 2007 Sensorimotor Training in Adults with Hemiplegic Cerebral Palsy – The ULTrA Project. Dept. of Physical Therapy and Rehabilitation. Univ. California San Francisco, March 2007
- The Science of Goal-Directed Movements: From Theory to Practice. Dept. of Physical Medicine and Rehabilitation, Univ. Michigan, April 2007
- 2008 Sensorimotor Coordination in Upper Limb Motor Disorders – Implications for Rehabilitation. Dept of Physical Medicine and Rehabilitation, Univ. Ghent, Belgium, June 2008

INVITED WORKSHOPS:

- 1997 A New Look at the Upper Extremity: Qualitative and Quantitative Evaluation American Academy of Physical Medicine and Rehabilitation Physical Medicine Annual Assembly, Atlanta, Georgia
- 1997 Trends in Motor Control Research and their Application to Rehabilitation. Washtenaw County Occupational and Physical Therapy Group, (continuing medical education program)
- 1998 Stability and Instability in the Assessment of Upper Limb Movements. Dynamic Systems Theory: Research in Rehabilitation Workshop. American Congress of Rehabilitation Medicine, Seattle, Washington
- 2002 Role of Exercise in Parkinson's Disease. Turner Geriatrics Center, UM Hospital, May, 2002
Role of Sensory Cueing and Exercise in Parkinson's Disease. Maritime Chapter of the National Parkinson's Disease Association, Fredericton, Canada. November, 2002
- 2006-2007 NIH Task Force on Childhood Motor Disorders: "Clinical Measurement of Negative Motor Symptoms in Children" March 4-5, Stanford University, California

TEACHING:

- 1993-1994 Movement Science (MVS) 421 (3 cr) - Disorders of Voluntary Movement (developed as a new upper level elective course) (F 93) (15 students)
MVS 320 (4 cr) - Motor Control (extensively revised and expanded with an emphasis on neurophysiological mechanisms underlying human movement- one of three required core courses in the MVS program) (W94) (45 students)
MVS 488 (2-3 cr) Independent Laboratory Study in Motor Control (F/W 93/94) (2 students/semester)

- 1994-1995 MVS 305 (3 cr) - *Motor Control and Biomechanics of Human Aging* (developed as new course with Dr. M. Gross) (F 94) (28 students)
MVS 320 (F94, W95) (55 students)
MVS 421 (W95) (47 students)
MVS 488 (F/W 94/95) (3 students/semester)
KIN 610 *Topics in Kinesiology (guest lecturer)*
- 1995-1996 MVS 110 (3 cr) - *Physiological and Psychological Bases of Human Movement* (extensively revised and re-structured for team teaching (motor control, biomechanics, exercise physiology, responsible for complete revision of motor control module and coordinating new teaching materials for all three modules) (F95) (35 students)
MVS 521 (3 cr) - *Visuomotor Coordination* (developed as a new course) (F95) (14 students)
MVS 320 (W96) (53 students)
MVS 305 (W96) (44 students)
MVS 490 *Honors Undergraduate Thesis* (5 cr) (F/W 95/96) (2 students/semester)
MVS 429 (3 cr) *Laboratory Experience and Seminar in Motor Control - MVS seniors* (F/W 96/97) (3 students/semester)
MVS 488 (F/W 95/96) (2 students/semester)
- 1996-1997 MVS 110 (F96) (42 students)
MVS 421 (F96) (39 students)
MVS 490 *Honors thesis* (F/W 96/97) (2 students/semester)
MVS 429 (F/W 96/97) (4 students/semester)
MVS 488 (F/W 96/97) (2 students/semester)
mentor and supervisor- UM Summer Research Opportunity Program grant awarded to E. Reed (full time - spring/summer)
- 1997-1998 MVS 320 (F97) (45 students)
MVS 421 (W98) (40 students)
MVS 490 *Honors thesis* (F/W 97/98) (2 students/semester)
MVS 429 (F/W 97/98) (3 students/semester)
MVS 305 (guest lecturer)
KIN 610 (guest lecturer)
IOE 591 (guest lecturer)
- 1998-1999 MVS 320 (F98) (50 students)
MVS 421 (W99) (42 students)
KIN 520 (W99) (7 students)
MVS 490 *Honors thesis* (F/W 98/99) (3 students/semester)
MVS 429 (F/W 98/99) (3 students/semester)
MVS 488 (F/W 98/99) (2 students/semester)
- 1999-2000 MVS 320 (F99) (46 students)
MVS 490 *Honors thesis* (F/W 99/00) (2 students/semester)
MVS 429 (F/W 99/00) (3 students/semester)
MVS 320 (W00) (46 students)
MVS 421 (W00) (35 students)
- 2000-2001 MVS 320 (F00) (33 students)
MVS 429 (F00) (12 students)
MVS 490 *Honors thesis* (F/W 00-01) (3 students/semester)
KIN 520 (F00) (8 students)

	<u>MVS 421</u> (W01) (38 students)
2001-2002	<u>MVS 320</u> (F01) (40 students) <u>MVS 429</u> (F01) (12 students) <u>MVS 320</u> (W02) (40 students) <u>MVS 421</u> (W02) (19 students)
2002-2003	<u>Gerontol 3673</u> (F02) (28 students) (St Thomas University) <u>MVS 421</u> (W03) (38 students)
2003-2004	<u>MVS 320</u> (F03) (36 students) <u>MVS 421</u> (W04) (48 students)
2004-2005	MVS 320 (F04) (39 students) MVS 421 (W05) (30 students)
2005-2006	MVS 320 (F05) (30 students) MVS 421 (W06) (19 students)
2006-2007	MVS 320 (F06) R580 (F06) Topics in Disabilities Studies
2007-2008	MVS 320 (F07) (43 students) KIN 520 Graduate Seminar – Topics in Motor Control/Grant Writing (12 students) MVS 320 (W08) (68 students) MVS 421 (22 students)

GRADUATE STUDENT TRAINING:

Primary Advisor:

Univ. Duesseldorf:

1989-1994 M. Mertens, (Doctoral co-advisor), Dept. of Neurology, Univ. Duesseldorf
Disturbances in movement trajectory due to cerebellar dysfunction
K. Kessler (Doctoral co-advisor), Dept. of Neurology, Univ. Duesseldorf
Eye-arm coordination in cerebellar patients.

University of Western Ontario:

1991-1993 N. Virji-Babul (M.Sc. co-advisor), Program in Neuroscience, Univ. Western Ontario
Effects of gravitational loads on muscle activation patterns

Masters - University of Michigan:

1993-1994 J. Benjamin, Kinesiology, UM
Effects of sensory cueing on movement accuracy: gender differences

1996-1998 E. Flansburg, Kinesiology, UM
Sensory control of bimanual coordination

1997- 1999 Kuang-You Cheng, Kinesiology, UM
Influence of tonic neck reflexes on upper limb kinematics and EMG patterns during rhythmic voluntary movements

2000-2001 Amy Campbell, Kinesiology, UM
Motor coordination in high functioning Autism

2007- Sadie Wilcox, Art and Design, UM

Masters - other

2006 Karen Healy, BPT, University College, London, England

Doctoral - UM

1998 Donna Fry-Welch (PhD co-chair), Kinesiology, UM
Training Effects on Proprioceptive Acuity

1995-2007 G. Conti, Kinesiology, UM (chair) part-time
Effects of aging on bimanual force control

1996 - 2003 T. Liberzon, Kinesiology, UM (chair)
Role of auditory cueing in the performance of rhythmic arm movements

1997 -2002 Cathy Larson, Kinesiology, UM (chair)
Arm reaching clearance tasks in patients with essential tremor

1998-2002 Cengiz Yakut, Kinesiology, UM (co-chair)

2000- Min Huang, Kinesiology, UM (chair) part-time
Limb-posture coordination in elderly individuals

2002-2007 Dann Goble (chair), currently a post-doctoral student – Univ. Leuven

2002-2007 Diane Adamo (chair), currently a post-doctoral student– Wayne State Univ.

2006- Melissa Wright, Kinesiology (chair)

Dissertation committee member:

1993-1998 D. Fry-Welch (Kinesiology, UM)
(Training Effects on Proprioceptive Acuity)

1995-1999 H.-M. Chai (Kinesiology, UM)
(Dynamic Balance Control in Young and Elderly Adults)

1996-1999 K. Monroe (Industrial and Operations Engineering, UM)
(Evaluation of Factors Influencing Static Work Postures: Effects of Age and Gender)

1999-2003 J. Streepey (Kinesiology, UM)
(Dynamic Balance Control in Children)

2001- 2005 H. Kim (Industrial and Operations Engineering, UM)
(Head and Arm Coordination During Reaching Movements)

2002-2006 S. McKay (Kinesiology, UM)

2004-2005 J. Czibek (Kinesiology, UM)

2006- J. Aguera (Kinesiology, UM)

2006- B. Smith (Kinesiology, UM)

2008- B. Fling (Kinesiology, UM)

HOST/MENTOR - VISITING RESEARCH SCHOLARS:

1993 M.H. Thaut, Ph.D., Colorado State Univ.
H. Hefter, M.D. Dept. of Neurology, Univ. Duesseldorf

1994 K. Kessler, M.D., Dept. of Neurology. Univ. Duesseldorf

1993 - 1995 E. Ramos, M.D., Dept. of Physical Medicine and Rehabilitation, Univ. Puerto Rico, NIH
Rehabilitation Research Fellow
(in conjunction with Physical Medicine and Rehabilitation, Univ. Michigan)

1997, 1998 E. Ramos, M.D. Dept. of Physical Medicine and Rehabilitation, Univ. Puerto Rico

1998-1999 R. Ayangar, M.D. Dept. of Physical Medicine and Rehabilitation, Univ. Michigan
(in conjunction with Physical Medicine and Rehabilitation, Univ. Michigan)

2002 M. Fernandez del Olmo, PhD Dept. of Medicine, University of Corunna, Spain

2005-2006 K. Healy, BsPT, University College, London, England

POST-DOCTORAL FELLOWS:

1999-2002 R. Gregory
2003-2007 C. Lewis