

Rachael D. Seidler, Ph.D.

Associate Professor  
Department of Psychology  
& School of Kinesiology  
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**Education**

Post-Doc.	University of Minnesota/VAMC	Neuroscience/BSC	2000-01
Ph.D.	Arizona State University	Ex. Sci. (motor control)	1999
M.S.	Arizona State University	Ex. Sci. (biomechanics)	1995
B.S.	University of Oregon	Ex. Sci. (Biology minor)	1992

**Professional Experience**

Associate Professor with tenure, School of Kinesiology & Department of Psychology (50-50 joint appointment), University of Michigan, 2009 – present.  
Assistant Professor, School of Kinesiology & Department of Psychology (50-50 joint appointment), University of Michigan, 2003 – 2009.  
Assistant Research Scientist & Movement Science Faculty, University of Michigan Div. of Kinesiology. Sept 2001- June 2003.  
Postdoctoral Associate, Brain Sciences Center, Minneapolis VAMC & Dept. of Neuroscience, University of Minnesota. March 2000- Sept. 2001.  
Research Associate, Arizona State University. August 1999- March 2000.  
NASA Graduate Student Researcher, Arizona State University and The Johnson Space Center. July 1997- August 1999.  
Motor Control Research Assistantship, Arizona State University. August 1994- June 1997.  
Biomechanics Research Technician, Dynamic Spinal Analysis. May 1994- April 1995.  
Biomechanics Research Assistantship, Arizona State University. August 1992- June 1994.  
Biomechanics Summer Internship, Nike Sport Research Lab. Summer, 1993.

**Affiliations**

Neuroscience Graduate Program Faculty, University of Michigan, May 2002 – present.  
LIFE Program Faculty, July 2003 – present (The Life Course: Evolutionary and Ontogenetic Dynamics, a collaborative graduate program between Max Planck Institute for Human Development, Berlin; Humboldt University, Berlin; Free University of Berlin; University of Virginia, and University of Michigan).  
University of Michigan Institute of Gerontology, October 2003 – present.

**Funded Grant Applications- Federal & Foundation Grants**

Gustavus and Louise Pfeiffer Research Foundation (R. Seidler, PI, M. Muller Co-I, N. Bohnen Consultant), "Parkinson's Disease: Interactions Between Stage of Disease, Treatment, and Motor and Cognitive Performance". January 1, 2008 – December 31, 2009, \$150,000 direct costs.

- 1 R01 NS 052514-01A1 (R. C. Welsh PI, R. Seidler & K. Gruis Co-I's), "Cortex Changes in Real / Imagined Movements in ALS". 09/30/2007- 08/30/2011, \$1,421,479 total costs.
- 1 R01 AG 24106-01A1 (R. Seidler PI, P. Reuter-Lorenz & D. Noll Co-I's). "Skill acquisition in older adults". 09/01/2005- 08/31/2009, \$1,194,100 total costs.
- 1 R01 AG24106 A1 W1 Research Supplement to Promote Diversity in Health Related Research, (R. Seidler PI, faculty advisor for Joaquin Anguera). 2/15/2006- 12/31/2008. \$182,229 total costs.
- NIH T32 AG000114-21 Biomedical Research Training in the Biology of Aging, Richard Miller PI. Provides support for pre and postdoctoral trainees, funded through April 2010.
- NIH OAIC RCDC, 9/1/2004 – 12/31/2005 (PI on subaccount, \$26,813 direct costs, \$40,756 total costs). This UM Pepper Center award provided funding to reduce my teaching obligations, in order to allow for faculty career development activities (workshops, retreats, seminars, etc).
- UM Claude Pepper Older Americans Independence Center Pilot Grant, 7/1/2003 – 6/30/2004. (R. Seidler, PI). "Age-Related Declines in Bimanual Coordination: Neural Mechanisms and Potential for Compensation". One year application, \$35,000 direct costs, \$53,550 total costs.
- NASA NBEI Award, UM Biomedical Engineering Department, 2003- 2007. (R. Seidler, Co-Investigator). Five year application, \$6,400,000 total costs (over 40 UM faculty), funding discontinued in summer 2007 due to reassignment of NASA priorities. R. Seidler, D. Noll, & S. Takayama, Transport Project 1, "Neural and Neurovascular Changes in Simulated Microgravity".
- NIA AG20883, R03 Pilot Grant Program, March 2000 (R. Seidler, PI, acceptance of funding delayed until 2001). "Impaired Sensorimotor Plasticity in the Elderly", one year, \$75,500 total costs.
- NASA NRA 98-HEDS-02, September 1999 (J. J. Bloomberg, PI, R. Seidler Co-Investigator). "Promoting sensorimotor response generalizability: A countermeasure to mitigate locomotor dysfunction after long-duration space flight". Three years, \$797,080 total costs.
- NASA Graduate Student Researchers Program Award, 1997-1999 (R. Seidler, PI). Three year predoctoral fellowship award for "The Role of Vestibular Information in Eye-Head-Hand Coordination". Three years at \$66,000 (no indirect costs).

### **Funded Grant Applications- Intramural**

- Michigan Center for Advancing Safe Transportation throughout the Lifespan Research Excellence Program # DTRT07-G-0058 (R. Seidler, PI, J. Jonides, S. Jaeggi, M. Buschkuehl, Cols) "Cognitive training as an intervention to improve driving ability in the older adult", 09/15/08 – 09/14/09, \$246,346 total costs.
- UM Rackham Faculty Grant (R. Seidler, PI), 2007-08. "Parkinson's disease: interactions between stage of disease, treatment, and motor and cognitive performance". \$15,315.
- UM Office of the Vice President for Research Faculty Grant, 8/1/2003 – 7/31/2004 (R. Seidler, PI). "Motor Behavioral Changes with Age: Neural Mechanisms and Compensation in the Aging Brain". \$14,292.
- UM Rackham Spring / Summer doctoral student support, 2003 (\$4,000 salary for Prudhvi R. Chintalapati, ME doctoral student). "Neuroimaging of human motor skill learning processes".
- Undergraduate Research Opportunity Program Summer Biomedical Research Fellowship, 2003 (research supervisor for Cori Chase, spring / summer student salary, \$3500). "Does handedness predict transfer of learning?"
- UM FMRI Center pilot grant application, 2002 (R. Seidler, PI, allows MRI acquisition of pilot

subject data). Renewed for 2003.  
Rackham Faculty Grant (UM intramural program, R. Seidler, PI). "Neuroimaging of Human Motor Skill Learning Processes". \$14,885 for period 01/01/02 – 12/31/02.  
UM Undergraduate Research Opportunity Program, 2001-2002 supplementary student funding, \$300.  
Arizona State University Graduate and Professional Students' Association Grant, 1993 for Master's Thesis research "The Effects of Balance Training on the Posture Control of Older Adults", \$1800.

### **Pending Grant Applications**

1 R01 AG 24106-01A1 (PI Seidler, competitive renewal application submitted March 2009, Seidler 2.93 academic months, 2 summer months), 01/01/2010- 12/31/2014, \$1,866,596. "Skill acquisition in older adults"  
1 R01 AG 24106 Administrative supplement request for "Skill Acquisition in Older Adults", 06/01/2009- 07/31/2010, \$158,500 total costs.  
NIH (PI Halter, Seidler .9 academic months). Submitted March 2009, 09/01/09-08/31/14, \$8,801,611, Claude D. Pepper Older Americans Independence Centers competitive renewal, pilot project.  
NIH R21 "EEG Based Imaging of Motor Cortical Activity during Human Locomotion". D. Ferris PI, S. Makeig, W. Gehring, R. Seidler CoIs. Submitted February 2009.  
NSF application, "High Density EEG-Based Functional Brain Imaging During Human Walking". D. Ferris PI, S. Makeig, W. Gehring, R. Seidler CoIs. Submitted February 2009.  
NIH R21 "Parkinson's Disease: Interactions Between Stage of Disease, Treatment, and Motor and Cognitive Performance". R. Seidler, PI, M. Muller Co-I, N. Bohnen Consultant (under revision).

### **Publications in review / in preparation, <sup>a</sup>undergraduate student, <sup>b</sup>graduate student, <sup>c</sup>postdoctoral associate**

<sup>b</sup>Bangert, A. S., Reuter-Lorenz, P. A., <sup>b</sup>Quinn-Walsh, C. M., <sup>a</sup>Boonin, A., & Seidler, R. D. (under review). The effect of aging on discrete and continuous bimanual coordination: Does aging lead to a cortical disconnection?  
<sup>b</sup>Anguera, J. A., Reuter-Lorenz, P.A., Willingham, D.T., & Seidler, R.D. (under review). Contributions of spatial working memory to visuomotor adaptation.  
<sup>b</sup>Anguera, J. A., Seidler, R. D., & Gehring, W. J. (under review). Changes in error monitoring during motor learning.  
<sup>b</sup>Kwak, Y., Muller, M. L. T. M., Bohnen, N. I., Dayalu, P., & Seidler, R. D. (under review). Effect of dopaminergic medications on the time course of explicit motor sequence learning in Parkinson's disease.  
<sup>c</sup>Langan, J., Peltier S., <sup>c</sup>Bo, J., <sup>b</sup>Fling, B. W., Welsh, R. C., & Seidler, R.D. (under review). Functional implications of age-related changes in motor system connectivity.  
<sup>c</sup>Bo, J., Borza, V. & Seidler, R. D. (under review). Age-related declines in visuospatial working memory correlate with deficits in explicit motor sequence learning.  
<sup>b</sup>Fling, B. W., <sup>b</sup>Walsh, C. M., <sup>b</sup>Bangert, A. S., Reuter-Lorenz, P. A., Welsh, R. C., & Seidler, R. D. (under review). Task dependence of relationships between callosal white matter integrity and motor performance.  
<sup>c</sup>Bo, J. & Seidler, R. D. (under review). Spatial and symbolic sequence learning in young and older adults.  
<sup>b</sup>Bangert, A. S., Reuter-Lorenz, P. A., & Seidler, R. D. (manuscript in preparation for submission). Mechanisms of timing across tasks and intervals.

<sup>a</sup>Szabo, A., <sup>b</sup>Bangert, A. S., & Seidler, R. D. (manuscript in preparation for submission).  
Physical fitness mediates age-related changes in temporal reproduction.

**Peer-reviewed research publications, <sup>a</sup>undergraduate student, <sup>b</sup>graduate student, <sup>c</sup>postdoctoral associate**

24. <sup>c</sup>Bo, J. & Seidler, R. D. (in press). Visuospatial working memory capacity predicts the organization of acquired explicit motor sequences. *Journal of Neurophysiology*.
23. <sup>a</sup>Chase, C. & Seidler, R. (2008). Direction and degree of handedness affect intermanual transfer of skill learning. *Experimental Brain Research*, 190: 317-328.
22. Seidler, R. D. & Noll, D. C. (2008). Neuroanatomical correlates of motor acquisition and motor transfer. *Journal of Neurophysiology*, 99: 1836-1845.
21. <sup>b</sup>Anguera, J.A., <sup>a</sup>Russell, C.A., Noll, D.C., & Seidler, R.D. (2007). Neural correlates associated with intermanual transfer of sensorimotor adaptation. *Brain Research*, 1185: 136-151.
20. Seidler, R. D. (2007). Older adults can learn to learn new motor skills. *Behavioural Brain Research* 183: 118-122.
19. Seidler, R. D. (2007). Aging affects motor learning but not savings at transfer of learning. *Learning & Memory* 14: 17-21.
18. Seidler, R. D., Tuite, P., & Ashe, J. (2007). Selective impairments in implicit learning in Parkinson's Disease. *Brain Research* 1137: 104-110.
17. Seidler, R. D., Noll, D. C., & Chintalapati, P. (2006). Bilateral basal ganglia activation associated with sensorimotor adaptation. *Experimental Brain Research* 175: 544-555.
16. Seidler, R. D. (2006). Differential effects of age on sequence learning and sensorimotor adaptation. *Brain Research Bulletin* 70: 337-346.
15. Seidler, R. D., Purushotham, A., Kim, S., Willingham, D., Ugurbil, K. & Ashe, J. (2005). Neural correlates of encoding and expression in implicit sequence learning. *Experimental Brain Research* 165: 114-124.
14. Seidler, R. D. (2005). Differential transfer processes in incremental visuomotor adaptation. *Motor Control* 9: 40-58.
13. Seidler, R. D., Noll, D. C., & Thiers, G. (2004). Feedforward and feedback processes in motor control. *NeuroImage*, 22(4): 1775-1783.
12. Seidler, R. D. (2004). Multiple motor learning experiences enhance motor adaptability. *Journal of Cognitive Neuroscience* 16: 65-73.
11. Stancak, A., Cohen, E., Seidler, R. D., Duong, T. Q., & Kim, S. (2003). The size of corpus callosum and the functional activation of motor cortical areas in bimanual and unimanual movements. *Cerebral Cortex*, 13, 475-485.
10. Seidler, R. D., Purushotham, A., Kim, S., Willingham, D., Ugurbil, K. & Ashe, J. (2002). Cerebellum activation associated with performance change but not motor learning. *Science*, 296, 2043-2046.  
For commentary see: Hazeltine E & Ivry RB (2002). *Neuroscience*. Can we teach the cerebellum new tricks? *Science*, 296, 1979-80.
9. Seidler, R. D., Alberts, J. L., & Stelmach, G. E. (2002). Changes in multi-joint performance with age. *Motor Control*, 6, 19-31.
8. Ketcham, C. J., Seidler, R. D., van Gemmert, A. W., & Stelmach, G. E. (2002). Age-related kinematic differences as influenced by task difficulty, target size, and movement amplitude. *Journal of Gerontology: Psychological Sciences*, 57, P54-P64.
7. Seidler, R. D., Alberts, J. L., & Stelmach, G. E. (2001). Multi-joint movement control in Parkinson's disease. *Experimental Brain Research*. 140(3), 335-344.
6. Seidler, R. D., Bloomberg J. J., & Stelmach, G. E. (2001). Patterns of transfer of adaptation among body segments. *Behavioural Brain Research*. 122, 145-157.

5. Seidler, R. D., Bloomberg, J. J., & Stelmach, G. E. (2001). Context-specific arm pointing adaptation. *Behavioural Brain Research*, 119(2), 155-166.
4. Seidler R. D. & Stelmach, G. E. (2000). Trunk assisted prehension: Specification of body segments with imposed temporal constraints. *Journal of Motor Behavior*, 32, 379-389.
3. Seidler-Dobrin, R. D., He, J., & Stelmach, G. E. (1998). Coactivation to reduce variability in the elderly. *Motor Control*, 2, 314-330.
2. Seidler-Dobrin, R. D. & Stelmach G. E. (1998). Persistence in visual feedback control by the elderly. *Experimental Brain Research*, 119, 467-474.
1. Seidler, R. D. & Martin, P. E. (1997). The effects of short term balance training on the postural control of older adults. *Gait and Posture*, 6(3), 224-236.

**Review Papers, Book Chapters, & Conference Proceedings, <sup>a</sup>undergraduate student, <sup>b</sup>graduate student, <sup>c</sup>postdoctoral associate**

11. Seidler, R. D., <sup>b</sup>Bernard, J. A., <sup>b</sup>Burutolu, T. B., <sup>b</sup>Fling, B. W., <sup>b</sup>Gordon, M. T., <sup>b</sup>Gwin, J. T., <sup>b</sup>Kwak, Y., and <sup>b</sup>Lipps, D. B. (in preparation). Motor control and aging: links to brain structural, functional, and biochemical changes.
10. Lustig, C., Shah, P., Seidler, R. D., & Reuter-Lorenz, P. (under review for special issue on plasticity in the aging brain, *Neuropsychology Review*). Aging, training, and the brain: A review and future directions.
9. Seidler, R. D. (2009). Neural correlates of motor learning, transfer of learning, and learning to learn. Invited paper for Exercise and Sport Sciences Reviews. Vol 37 issue 4.
8. <sup>c</sup>Bo, J., <sup>c</sup>Langan, J., & Seidler, R. D. (2008). Cognitive Neuroscience of Skill Acquisition. In *Advances in Psychology*, vol. 139, Human Learning: Biology, Brain, and Neuroscience pp.101-112. A. Benjamin, B. Etnyre, & T. Polk, Eds.
7. Seidler, R. D. & Ashe, J. (2008). Procedural Learning: Cerebellum Models. Entry for *Encyclopedia of Neuroscience*, L. Squire, Ed, Elsevier.
6. Seidler, R. D., <sup>b</sup>Bangert A. S., <sup>b</sup>Anguera, J. A., & <sup>b</sup>Walsh, C. M. (2006). Motor Performance, pp.801 - 806. Invited review chapter for *Encyclopedia on Aging*. R. Schulz, L. Noelker, K. Rockwood, R. Sprott, eds. Springer Publishing.
5. Seidler, R. D. , <sup>b</sup>Bangert A. S., <sup>b</sup>Anguera, J. A., & <sup>b</sup>Walsh, C. M. (2006). Motor Control, pp. 228-236. *Encyclopedia of Gerontology (Second Edition): Age, Aging and the Aged*. J. Birren, editor. Elsevier press.
4. Ketcham, C. J., Dounskaia, N., Seidler, R. D. & Stelmach, G. E. (2000). Multijoint control is compromised in Parkinson's Disease Patients. *Journal of Human Kinetics* 4 (supplement), 85-95.
3. Seidler-Dobrin, R. D. & Stelmach, G. E. (1997). Practice and visual feedback in the elderly. In *Healthy Aging, Activity and Sports*, Proc. of IVth International Congress on Physical Activity, Aging, and Sports, G. Huber (ed.). Health Promotion Publications: Germany. pp. 109-117.
2. Seidler, R. D. & Stelmach, G. E. (1996). Motor performance. In *Encyclopedia of Gerontology: Age, Aging, and the Aged*. San Diego: Academic Press, Inc. pp. 177-185.
1. Seidler, R. D. & Stelmach, G. E. (1995). Reduction in sensorimotor control with age. *Quest*, 47, 386-394.

**Honors and Awards**

NIH Loan Repayment Program Awardee, 2003 - 2005  
International Graphonomics Society 2003- present, Annual Meeting Program Committee  
NASA / ASEE Summer Faculty Fellow Award, Johnson Space Center, Houston, TX 2002  
University of Michigan Nominee for Dana Clinical Hypotheses Program in Brain Imaging Grant

Competition, 2001

Society for Neuroscience Women in Neuroscience Travel Award Finalist 1999

Neural Control of Movement Annual Conference Travel Award 1999, Princeville, HI

Preparing Future Faculty Fellow 1998-9

A. S. U. Regents' Graduate Academic Scholarship 1998

Rousseau Award for graduate student research in gerontology, 1997

Society for Neuroscience student member, 1997- 1999

Society for Neuroscience full member, 2000- present.

Neural Control of Movement Society member, 1998-present

Cognitive Neuroscience Society member, 2005-present

International Graphonomics Society member, 2003-present

### **University & Professional Service**

2008-9 Co-chair (with S. Brown), Kinesiology search committee for Motor Control faculty position

2008-09 Cognition & Perception area (Psychology) graduate recruitment committee

2007-09 Advisory board member for DOED-NIDRR grant "Adapted Assessment of Speed of Information Processing in Children with Cerebral Palsy", S. Warschusky, M. van Tubbergen, and J. Kaufman, University of Michigan, investigators.

2006-7 Psychology Department Augmented Executive Committee (for faculty annual reviews Spring 2007)

2006-7 Kinesiology search committee member for Exercise Physiology faculty position

2006 Kinesiology committee for faculty / staff giving program

2005 UM NIH Pepper Center junior faculty representative

2004 Winter semester graduation marshal for Kinesiology

2003-5 Neuroscience Program Executive Committee member

2003-4 Cognition & Perception area graduate recruitment committee member

2003-4 Cognition & Perception area graduate admissions committee member

2003-4 Psychology Department Augmented Executive Committee (for faculty annual reviews Spring 2004)

2003 Fall semester graduation marshal for Psychology

2002 UM Preparing Future Faculty Seminar- panel presentation by junior faculty for UM graduate students.

2000 13<sup>th</sup> IAA Humans in Space Conference, Session Rapporteur.

1999 Search committee member to hire Exercise Science Ph.D. Program Director.

1997 search committee member for Senior Systems Analyst position, ESPE department.

1996- 1998 Motor Control Laboratory network backup administrator.

1996-2000: tours of Exercise and Sport Research Institute to various community groups.

### **Community Service**

2009 "The Aging Brain: Declines and Interventions" presentation to the UM annual Mini Med course (public course offering, 300 students)

2009 "Neural Control of Movement" presentation to Michigan Research Community (UROP students)

2009 "Cognitive Training as an Intervention to Improve Driving in Older Adults" presentation to Michigan Mobility Meeting (state transportation officials, ARRP staff, community organizations, occupational therapists, etc)

2004-2006 "The brain-mind-muscle-connection". University of Michigan Saturday seminar program for local area high school students.

- 2004 "This is your brain on dance", public program on the integration of arts and technology, sponsored by the UM Life Sciences, Values & Society Program, in association with residence of the Merce Cunningham Dance Company. Assisted in program planning and participated as a panel speaker.
- 2003, 2005, 2008 Ann Arbor Brains Rule day- reverse science fair for local area 6<sup>th</sup> grade students. Organized, planned, and conducted a demonstration on the neuroscience of movement.
- 2001 U MN Center for Magnetic Resonance Research open house- prepared lectures and mock experiments for 1 day visit by Minneapolis local jr. high & high school students.
- 2001 Presentation to Minneapolis Parkinson's support group: Motor Learning in Parkinson's Disease (slide presentation).
- 2000 Oasis program speaker, Aging and Balance Control.
- 1999 "Journeys of the Mind" seminar speaker (public education series).
- 1998 Workshop speaker, Explorathon AZ for Women in Science and Engineering (jr. high school girls).
- 1998 Classroom visit, Tesseract Elementary School. NASA research & activities.
- 1998 Presentation to Central Phoenix Parkinson's support group: Motor Control and Parkinson's Disease (slide presentation).
- 1995 Presentation to Sun City Parkinson's support group: Balance Training for the Elderly.

### **Editorships**

March 2007- 2010, Consulting Editor for the Journal of Motor Behavior

### **Ad Hoc Reviewer**

#### Journals:

<i>Acta Psychologica</i>	<i>Journal of Neurophysiology</i>
<i>Behavioural Brain Research</i>	<i>Journal of Neuroscience</i>
<i>Brain</i>	<i>Journal of Neuroscience Methods</i>
<i>Brain Imaging &amp; Behavior</i>	<i>Journal of the International Neuropsychological Society</i>
<i>Cerebral Cortex</i>	<i>Journal of the Neurological Sciences</i>
<i>Clinical Interventions in Aging</i>	<i>Motor Control</i>
<i>Current Aging Science</i>	<i>Neurobiology of Aging</i>
<i>Exercise and Sport Sciences Reviews</i>	<i>Neuroimage</i>
<i>Experimental Brain Research</i>	<i>Neuropsychologia</i>
<i>Human Brain Mapping</i>	<i>Neuropsychology</i>
<i>Journal of Applied Biomechanics</i>	<i>Neuroscience Letters</i>
<i>Journal of Applied Physiology</i>	<i>PLOS Computational Biology</i>
<i>Journal of Cognitive Neuroscience</i>	<i>Psychological Science</i>
<i>Journal of Experimental Psychology: Learning, Memory &amp; Cognition</i>	<i>Psychology and Aging</i>
<i>Journal of Gerontology: Medical Sciences</i>	<i>Quarterly Journal of Experimental Psychology</i>
<i>Journal of Gerontology: Psychological Sciences</i>	<i>Research Quarterly for Exercise and Sport</i>
<i>Journal of Motor Behavior</i>	<i>Trends in Cognitive Sciences</i>

#### Grant Reviews:

Extramural

NIH ZRG1 BBBP-J and BBBP-L panels ad hoc reviewer for Challenge Grants, phase 1 (mail)

NSF Graduate Fellowship Panelist 2007

NIH Cognition & Perception study section temporary member 2006, Sensory, Motor, and Cognitive Neuroscience fellowship study section temporary member 2006  
Medical Research Council grants, UK 2006  
Concerted Action Program of the Ministry of Education of Flanders (Belgium) Centres of Excellence 2005  
NASA 2004  
University of British Columbia intramural grant program 2004

#### Intramural

Michigan Institute for Clinical and Health Research (MICHR) CTSA pilot grant reviewer 2007  
UM NIH Pepper Center Career Development Awards program reviewer 2005, 2006  
University of Michigan OVPR faculty grant program reviewer 2005

#### Miscellaneous:

Book proposal review for The Johns Hopkins University Press (2007)  
Book proposal review for Palgrave Macmillan (2007)  
Textbook review for Allyn & Bacon Publishers (2002)  
International Graphonomics Society 2004, 2005, 2007 Annual Meeting Program Committee (paper reviewer)  
2005 Reviewed junior faculty abstracts for national NIH Claude D. Pepper Centers annual meeting (10 centers)

#### **Teaching Experience**

##### University of Michigan

##### Undergraduate courses:

MVS 424 Changes in Sensorimotor Control with Age (W 2002, n=21)  
MVS 320 Human Motor Control (F 2002, n=29; W 2006, n=36; W 2007, n=43)  
PSYCH 447 Cognitive Neuroscience of Action (F 2003, n=18; F 2005, n = 58; F 2006, n = 68, cross-listed as MVS 426)  
Independent studies (over 70 students since 2001): MVS 384, MVS 488, MVS 402, MVS 429, MVS 490, PSYCH 331, PSYCH 322, PSYCH 326, PSYCH 420, UROP, SROP

##### Graduate courses:

PSYCH 808 Cognitive Neuroscience of Action (F 2004 n=5 registered, 3 sitting in)  
KIN 512 Neural Control of Movement (W 2004, n=13, F 2008, n=10)  
Neurosci 616 Motor & Cognitive Systems (1 credit module of Neurosci 602 Principles of Neuroscience II, W 2003, n=19; W 2004, n=25)  
Independent studies (10 students since 2001, for whom I'm not the primary advisor): KIN 682, KIN 684, KIN 995, BIOMED 590, NEUROSCI 801, NEUROSCI 995

##### Arizona State University

Laboratory instructor, EPE 345 Motor and Developmental Learning, Fall 1998.  
1997-98 Assisted in mentoring of 2 master's degree students (Caroline Ketcham and Gabrielle Houston): demonstrated equipment usage, helped with experimental design, data processing issues, programming, and writing.

#### **Faculty Mentoring**

2008-present Jinsung Wang, University of Wisconsin-Milwaukee, K01 consultant / mentor, "Hemispheric Lateralization and Interlimb Transfer of Motor Learning", 5K01HD050245 supported by NICHD/NCMRRm 2007-2012

### Doctoral Students

2003-2007 Ashley Bangert (Psychology, UM, Co-Chair with Patti Reuter-Lorenz, currently a postdoctoral fellow at Washington University, St. Louis)  
2003-2008 Joaquin Anguera (Kinesiology, UM, Chair, currently a postdoctoral fellow at UC San Francisco)  
2007-present Youngbin Kwak (Neuroscience, UM, Chair)  
2007-present Jessica Bernard (Psychology, UM, Chair)  
2007-present Brett Fling (Kinesiology, UM, Chair)

### Doctoral Dissertation Committee Member

2002 Cathy Larson (Kinesiology, UM, member)  
2003- 2004 Leon Gmeindl (Psychology, UM, Cognate member)  
2004- 2005 Keith Gordon (Kinesiology, UM, member)  
2004- 2007 Diane Adamo (Kinesiology, UM, member)  
2005 – 2007 Daniel Goble (Kinesiology, UM, member)  
2007 - 2008 Michael Franklin (Psychology, UM, member)  
2006 – present Antoinette Domingo (Kinesiology, UM, member)  
2008 – present Mary ("Katie") Askren (Psychology, UM, Cognate member)

### Doctoral Student Guidance Committee Member

2003- 2007 Daniel Goble (Kinesiology, UM)  
2004- present Antoinette Domingo (Kinesiology, UM)  
2007- present Melissa Wright (Kinesiology, UM)  
2008 – present Joe Gwin (Kinesiology & Mechanical Engineering joint degree, UM)

### Postdoctoral Associates

2006- present Jin Bo  
2006- 2008 Jeanne Langan

### Senior Thesis Advisor

2002-3 Anna Boonin (Psychology, UM, Co-Advisor with Dr. P. Reuter-Lorenz)  
*"Better timing with time? The effects of practice & task difficulty on bimanual coordination"*  
2003-4 Cori Chase (Kinesiology, UM)  
*"Does handedness predict intermanual transfer of skill learning?"*  
2006-7 Amanda Szabo (Kinesiology, UM)  
*"Does physical activity mitigate age-related changes in timing?"*  
2008-9 Bryan Benson (Psychology, UM)  
*"Do explicit instructions and brief rest periods improve motor skill learning?"*

### Abstracts

Bangert, A. S., Reuter-Lorenz, P.A., & Seidler, R. D. (2008). Tick. Tock. How should we describe the clock? Mechanisms of temporal reproduction and discrimination across milliseconds and seconds. Annual Meeting of the Psychonomic Society, Chicago, IL.

- Bernard, J. A. & Seidler, R. D. (2008). Relationships between handedness and interhemispheric transfer time. Third International Conference on Transcranial Magnetic and Direct Current Stimulation, University of Gottingen, Germany.
- Bo, J., Peltier, S. J., Noll, D. C. & Seidler, R. D. (2008). Neural correlates of spatial and nonspatial implicit sequence learning. Society for Neuroscience annual meeting, Washington DC.
- Fling, B. W., Walsh, C. M., Bangert, A., Reuter-Lorenz, P. A., & Seidler, R. D. (2008). Neural correlates of complexity on a motor-tapping task. Society for Neuroscience annual meeting, Washington DC.
- Langan, J. L., Peltier, S. J., Bo, J. & Seidler, R. D. (2008). Age-related changes in functional connectivity of the motor system. Society for Neuroscience annual meeting, Washington DC.
- Anguera, J. A., Reuter-Lorenz, P.A., Willingham, D.T., Noll, D.C., & Seidler, R.D. (2007). Contributions of spatial working memory to visuomotor adaptation in young and older adults. Society for Neuroscience annual meeting, San Diego, CA.
- Bo, J. & Seidler, R.D. (2007). The role of spatial processing in sequence learning for young and older adults. Society for Neuroscience annual meeting, San Diego, CA.
- Langan, J. & Seidler, R.D. (2007). Cognitive Contributions to Motor Learning and Transfer of Learning in Young and Older Adults. Society for Neuroscience annual meeting, San Diego, CA.
- Bangert, A., Reuter-Lorenz, P.A., & Seidler, R.D. (2007). Mechanisms of Temporal Reproduction and Discrimination across Sub- and Supra-Second Durations. Neural Control of Movement Society, Seville, Spain.
- Anguera, J. A., Reuter-Lorenz, P.A., Willingham, D.T., Noll, D.C., & Seidler, RD. (2007). Contributions of Spatial Working Memory to Visuomotor Adaptation. Neural Control of Movement Society, Seville, Spain.
- Anguera, J. A., Reuter-Lorenz, P.A., Willingham, D.T., Noll, D.C., & Seidler, RD. (2007). Contributions of Spatial Working Memory to Visuomotor Adaptation. Human Brain Mapping, Chicago, IL.
- Anguera, J. A., Reuter-Lorenz, P.A., Willingham, D.T., Noll, D.C., & Seidler, RD. (2006). Contributions of Spatial Working Memory to Visuomotor Adaptation. Soc for Neurosci Abstracts, Atlanta, GA.
- Bangert, A., Reuter-Lorenz, P.A., & Seidler, R.D. (2006). Mechanisms of Temporal Reproduction and Discrimination across Sub- and Supra-Second Durations. Soc for Neurosci Abstracts, Atlanta, GA.
- Anguera, J.A., Russell, C.A., Noll, D.C., & Seidler, R.D. (2006). Neural correlates of intermanual transfer of sensorimotor adaptation. AREADNE conference, Santorini, Greece.
- Bangert, A., Reuter-Lorenz, P. A., & Seidler, R. D. (2006). Temporal Reproduction across Sub- and Supra-Second Durations: Modeling the Breakpoint. Annual meeting of the Cognitive Neuroscience Society, San Francisco, CA.
- Anguera, J. A., Seidler, R. D., & Gehring, W. J. (2006). Changes in error monitoring during motor learning. Annual meeting of the Cognitive Neuroscience Society, San Francisco, CA.
- Quinn-Walsh, C. M., Jonides, J., & Seidler, R. D. (2006). Skill Learning in Musicians. Annual meeting of the Cognitive Neuroscience Society, San Francisco, CA.
- Walsh, C.M.Q., Bangert, A.S., Goble, D.J., Boonin, A.E., Noll, D.C., Reuter-Lorenz, P.A. & Seidler, R.D. (2005). Age-related brain activation changes on a unimanual and bimanual tapping task. 4th Annual Symposium and Poster Presentations, State of Michigan Gerontology Conference.

- Anguera, J.A., Seidler, R.D., & Gehring, W. (2005). Event-related negativity in motor skill learning. Society for the Neural Control of Movement annual meeting, Key Biscayne, FL.
- Seidler, R.D., Chase, C., Gustafson, K. & Keen K. (2005). Aging dissociates motor learning and generalization of learning. Society for the Neural Control of Movement annual meeting, Key Biscayne, FL.
- Anguera, J.A., Russell, C.A., Noll, D.C., & Seidler, R.D. (2004). Sensorimotor adaptation: neural substrates and intermanual transfer of learning. Soc for Neurosci Abstracts.
- Bangert, A.S., Walsh, C.M., Boonin, A.E., Anderson, E., Goble, D.J., Reuter-Lorenz, P.A. & Seidler, R.D. (2004). The effects of aging on discrete and continuous motor coordination. Soc for Neurosci Abstracts.
- Walsh, C.M., Bangert, A.S., Goble, D.J., Boonin, A.E., Noll, D.C., Reuter-Lorenz, P.A. & Seidler, R.D. (2004). Neural correlates of age-related changes in unimanual and bimanual coordination. Soc for Neurosci Abstracts.
- Bangert, A.S., Walsh, C.M., Boonin, A.E., Anderson, E., Goble, D.J., Reuter-Lorenz, P.A. & Seidler, R.D. (2004). Age and bimanual motor coordination: implications for callosal declines. Cognitive Neuroscience Society Annual Meeting, San Francisco.
- Walsh, C.M., Goble, D.J., Bangert, A.S., Boonin, A.E., Noll, D.C., Reuter-Lorenz, P.A. & Seidler, R.D. (2004). Motor control and aging: neural indicators of compensation and decline. Cognitive Neuroscience Society Annual Meeting, San Francisco.
- Seidler, R.D., Noll, D.C. & Chintalapati P. (2003). Neural substrates contributing to generalization of aiming movements. International Graphonomics Society annual meeting, Scottsdale AZ.
- Seidler, R.D., Noll, D.C. & Chintalapati P. (2003). Sensorimotor adaptation: neural substrates and task difficulty effects. Soc for Neurosci Abstracts.
- Seidler, R.D., Noll, D.C., & Thiers, G. (2003). Brain regions correlated with level of motor performance. Society for the Neural Control of Movement annual meeting, Santa Barbara, CA.
- Seidler, R.D. (2002). Multiple motor learning experiences result in increased adaptability but reduced stability of control. Soc for Neurosci Abstracts.
- Seidler, R.D., Purushotham, A., Kim, S., Ugurbil, K. & Ashe, J (2002). An event-related fMRI investigation of motor preparatory processes. Society for the Neural Control of Movement annual meeting, Naples, FL.
- Seidler, R.D., Purushotham, A., Kim, S., Ugurbil, K., Willingham, D. & Ashe, J. (2001). The role of the cerebellum in motor learning and performance. Soc for Neurosci Abstracts, 27, Program No. 939.10.
- Seidler, R.D., Purushotham, A., Kim, S., Willingham, D. & Ashe, J. (2001). Implicit sequence encoding and expression of learning. Society for the Neural Control of Movement annual meeting, Sevilla, Spain.
- Seidler, R. D., Bloomberg, J. J., & Stelmach, G. E. (2000). Arm pointing adaptation and cue utilization. 13<sup>th</sup> IAA Humans in Space Symposium, Santorini, Greece.
- Seidler, R. D., Bloomberg, J. J., & Stelmach, G. E. (1999). Arm pointing adaptation and cue utilization. Soc for Neurosci Abstracts, 25, 2176.
- Ketcham, C. J., van Gemmert, A. W. A., Seidler, R. D., Stelmach, G. E. & Teulings, H. L. (1999). Movement kinematics and speed-accuracy constraints in Parkinson's Disease. Soc for Neurosci Abstracts, 25, 375.
- Seidler, R. D., Bloomberg, J. J., & Stelmach, G. E. (1999). Coordinate systems used for the execution of goal-directed actions. Society for the Neural Control of Movement annual meeting, Princeville, HI.
- Seidler-Dobrin, R. D., Bloomberg, J. J., & Stelmach, G. E. (1998). Do proximal and distal arm segments share the same representation? Society for Neuroscience Abstracts, vol. 24,

421.

Seidler-Dobrin, R. D. & Stelmach, G. E. (1998). Parkinson's disease affects the ability to control multijoint movements. North American Congress on Biomechanics, Waterloo, Ontario, Canada.

Seidler-Dobrin, R. D. & Stelmach, G. E. (1997). The role of the trunk in prehensile movements. Society for Neuroscience Abstracts, vol. 23, 2091.

Seidler-Dobrin, R. D.; Yamaguchi, G. T., & Stelmach, G. E. (1997). Are overshooting errors in hypergravity explained by the reinterpretation hypothesis? A simulation. Flinn Foundation Annual Meeting, Tuscon, AZ, May 1997 and ASB Conference, Clemson, S. Carolina Sept. 1997.

Seidler, R. D. & Stelmach, G. E. (1996). EMG Patterns: Age differences in a self-initiated, speed constrained movement. Society for Neuroscience Abstracts, vol. 22, 1638.

Seidler, R. D. & Stelmach, G. E. (1996). Reduced reliance on visual feedback as a function of practice. Engineering Foundation Conference: Biomechanics and Neural Control of Movement, Ohio.

Seidler, R. D. & Martin, P. E. (1996). The effects of balance training on the postural control of older adults. Canadian Society for Biomechanics Annual Meeting, British Columbia.

Seidler, R. D. , Teulings, H. L. T., & Stelmach, G. E. (1995). Aging Affects Reliance on Visual Feedback. Society for Neuroscience Abstracts, vol. 21, 1923.

Vint, P. F., DeWitt, J. K., Marsh, A. P., McLean, S. P., Seidler, R. D., Sherwood, C. P., Hinrichs, R. N., & Martin, P. E. (1994). Differences between one- and two- foot vertical jump performance. American Society for Biomechanics, Ohio.

## **Presentations**

2009: Do Cognitive Declines Contribute to Age-Related Motor Learning Deficits? Symposium presentation at NASPSPA annual meeting, Austin TX, June.

Age-Related Changes in Motor System Functional Connectivity. LIFE Academy, Zurich, Switzerland, May.

Cognitive Training as an Intervention to Improve Driving in Older Adults. Michigan Center for Advancing Safe Transportation Throughout the Lifespan, April.

2008: Motor Systems. Tutorial for Mathematical Biosciences Institute (Ohio State University) workshop, Real Time Brain Interfacing Applications, May.

Cognitive Contributions to Skill Acquisition. Department of Kinesiology seminar, Arizona State University, March

2007: Cognitive Neuroscience of Skill Learning and Transfer in Young and Older Adults. LIFE symposium, Berlin, Germany.

Cognitive Contributions to Skill Acquisition. Invited Army workshop, "Interactions Among Movement, Physical Exertion, and Cognitive Performance", US ARMY workshop, Natick, MA.

2006: Skill Learning and Transfer: Neural and Behavioral Mechanisms. Texas A&M University, Health and Kinesiology departmental seminar.

- 2004: Temporal Dynamics of Skill Acquisition. Motor Control: Trends and Perspectives conference, Tempe, AZ May 2004.
- Aging, interhemispheric communication, and bimanual coordination. University of Michigan Movement Science faculty seminar, May 2004.
- Aging, interhemispheric communication, and bimanual coordination. University of Michigan Neuropsychology department seminar, May 2004.
- Neural Substrates for Encoding and Expression of Implicit Sequence Learning. Neural Control of Movement satellite meeting on Motor Learning and Plasticity, March 2004, Barcelona Spain.
- 2003: Skill Acquisition in Older Adults. Arizona State University Motor Control Laboratory, Tempe AZ.
- Separating Motor Learning from Performance Change: An fMRI investigation. University of Michigan Biopsychology Colloquium.
- Skill Acquisition in Older Adults. Institute of Gerontology, University of Michigan.
- Functional Neuroimaging of Human Motor Skill Learning. Advanced Rehabilitation Research Training Program Seminar Series, University of Michigan Department of Physical Medicine and Rehabilitation.
- Sensorimotor Plasticity in the Elderly. LIFE Spring Academy-A collaborative graduate study program between the Max Planck Institute for Human Development, Berlin, the Humboldt-University in Berlin, the Free University of Berlin, and the University of Michigan, Ann Arbor, USA
- Neural Substrates for Encoding and Expression of Implicit Learning. University of California, Irvine, Cognitive Sciences Department colloquium.
- 2002: Motor Skill Learning: From Cognition to Skilled Repertoire. University of Michigan Cognition and Perception Forum.
- Separating Motor Learning from Performance Change: An fMRI investigation. University of Michigan Functional MRI Symposium.
- The Cerebellum, Motor Learning, and Performance Change. McKnight Brain Institute and Brooks Rehabilitation Center, University of Florida, Gainesville.
- 2001: Implicit Sequence Encoding and Expression of Learning. University of Michigan Industrial and Operations Engineering seminar series.
- Implicit Sequence Encoding and Expression of Learning: an fMRI investigation. Iowa State University, Dept. of Health & Human Performance.

Implicit Sequence Encoding and Expression of Learning: an fMRI investigation. University of Michigan, Division of Kinesiology.

- 2000: Sensorimotor Maps Used for the Execution of Goal-Directed Actions. Brain Sciences Center, Minneapolis VAMC.
- 1999: Coordinate Systems Used for the Execution of Goal-Directed Actions. State of Arizona Neuroscience Conference, Flagstaff, AZ Dec.
- Coordinate Systems Used for the Execution of Goal-Directed Actions. Action Club, The Pennsylvania State University.
- 1998: Changes in visual feedback reliance during motor learning in the elderly. State of Arizona Neuroscience Conference, Phoenix, AZ, Jan.
- 1997: Specification of body segments with imposed temporal constraints. "Doings in Motor Control" seminar, U. of Arizona, Tucson.

### **Workshops Attended**

- IMPAC, Interactions among Movement, Physical Activity, and Cognitive Performance, organized and hosted by US Army, Natick MA, June 2007.
- Enhancing Physical Activity in Healthy and Disabled Older Adults, The University of Michigan Older Americans Independence Center grant writing and research workshop, May 2003.
- Mini-Fellowship in Transcranial Magnetic Stimulation, Beth Israel Deaconess Medical Center, Harvard Medical School, July 2003.