

Rebecca M. C. Spencer

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Education

- 2002-2007 Post-doctoral fellow, Department of Psychology and Helen Wills Neuroscience Institute
University of California, Berkeley, Berkeley, CA, 94720
- 2002 Ph.D. in Neuroscience, Purdue University Interdisciplinary Neuroscience Program
Purdue University, West Lafayette, IN, 47907-1362
- 1997 B.A. in Biology, Departments of Biology
Hope College, Holland, MI 49423

Academic Positions

- 2008-present Assistant Professor and **Director of the Cognition and Action Laboratory**
Department of Psychology and Neuroscience and Behavior Program,
University of Massachusetts, Amherst, Amherst, MA 01003
- 2007-2008 Research Scientist, **Cognitive Neuroscience Laboratory** (PI: R. Ivry)
Department of Psychology and Helen Wills Neuroscience Institute
University of California, Berkeley, Berkeley, CA, 94720
- 2002-2007 Post-doctoral fellow, **Cognitive Neuroscience Laboratory** (PI: R. Ivry)
Department of Psychology and Helen Wills Neuroscience Institute
University of California, Berkeley, Berkeley, CA, 94720
- 1998-2002 Graduate Research Assistant, **Neural Control of Speech Laboratory** (PIs: C. Weber-Fox and A. Smith)
Department of Speech and Audiology
Purdue University, West Lafayette, IN, 47907-1362
- 1997-2002 Graduate Research Assistant, **Motor Control Laboratory** (PI: H. Zelaznik)
Department of Health and Kinesiology
Purdue University, West Lafayette, IN, 47907-1362
- 1996 Research Assistant, **Animal Behavior Laboratory** (PI: M. Sedlock)
Department of Biology
Hope College, Holland, MI 49423

Grants and Awards

- 2008-2010 **Somatotopic organization of the cerebellum and its role in plasticity.**
UMass Office of Research
- 2008-present **Age-related decline in sleep-dependent consolidation**
NIH R00 AG029710-01
- 2004-2009 **NIH Loan Repayment Program Award**
NIH LRP 2485860966
- 2004-2007 **Dissociation of motor deficits in learning tasks.**
NIH F32 NS048012-01
- 2001 **National Science Foundation Dissertation Improvement Grant**
NSF 0121930

Selected Scholarships and Fellowships

2010	Center for Research on Families Scholar , University of Massachusetts, Amherst
2010	Chancellor's Junior Fellow , University of Massachusetts, Amherst
2007	Editor's Choice Award , NeuroImage and the Organization of Human Brain Mapping
2006	Postdoctoral Trainee Award , Society for Neuroscience
2001	Carol J. Widule Outstanding Scholar/Service Award , Health & Kinesiology, Purdue University
2001	Recent Developments in Cerebellar Research Conference Fellowship , Washington University, St. Louis
2000 & 2001	Graduate Student Travel Award , Purdue Graduate Student Association
2000	Women in Science and Engineering Student Travel Grant , Committee on Institutional Cooperation
1997	Kathleen Ann White Memorial Award , Hope College
1997	William and Mabel Vanderbilt, Sr. Family Award , Hope College

Journal Publications

- Baran, B., Pace-Schott, E. F., Ericson, C., & **Spencer, R. M. C.** (in press). Processing of emotional reactivity and emotional memory over sleep. Journal of Neuroscience.
- Wilson, J., & Baran, B., Pace-Schott, E., Ivry, R. B., & **Spencer, R. M. C.** (in press). Sleep enhances declarative but not procedural learning in older adults. Neurobiology of Aging.
- Donohue, K. & **Spencer, R. M. C.** (2011). Continuous re-exposure to environmental sound cues during sleep does not improve memory for semantically unrelated word pairs. Journal of Cognitive Education and Psychology, *10*, 167-177.
- Pace-Schott, E., Nave, G., Morgan, A., & **Spencer, R. M. C.** (2011). Sleep-dependent modulation of affectively guided decision-making. Journal of Sleep Research. [epub ahead of print]
Press: Forbes, WWLP, WFCR, Irish Times, U.S. News & World Report, USA Today, Times of India, O-The Oprah Magazine, Science News, among others
- Pace-Schott, E., Shephard, E., **Spencer, R. M. C.**, Marcello, M., Tucker, M. A., Propper, R., Stickgold, R. (2011). Napping promotes inter-session habituation to emotional stimuli. Neurobiology of Learning & Memory, *95*, 24-36.
- Valera, E., **Spencer, R. M. C.**, Zeffiro, T., Biederman, J., Makris, T., Spencer, T., Faraone, N., Seidman, L. (2010). Neural substrate of impaired sensorimotor timing in adult Attention-deficit/hyperactivity disorder. Biological Psychiatry, *68*, 359-67.
- Schlerf, J., Verstynen, T., Ivry, R. B. & **Spencer, R. M. C.** (2010). Evidence of somatotopy in the lateral cerebellar hemisphere associated with complex actions. Journal of Neurophysiology, *103*, 3330-3336.
- Baran, B., Wilson, J., & **Spencer, R. M. C.** (2010). REM-dependent repair of competitive memory suppression. Experimental Brain Research, *23*, 471-477. (PMC Journal - In Process)
Press: The Collegian, Springfield Republican, PhysOrg, WFCR, Times of India, E! Science News, among others
- Spencer, R. M. C.** & Ivry, R. B. (2009). Sequence learning is preserved in individuals with cerebellar degeneration when the movements are directly cued. Journal of Cognitive Neuroscience, *21*, 1302-1310. (Accepted prior to 4/08)
- Spencer, R. M. C.**, Karmarkar, U. & Ivry R. B. (2009). Dedicated and intrinsic models of temporal encoding. Philosophical Transactions of the Royal Society of London B Biological Science, *364*, 1853-1863. (PMCID: PMC2685823)
- Weber-Fox, C., **Spencer, R. M. C.**, Spruill J. E., & Smith, A. (2008). Atypical neural functions underlying phonological processing and silent rehearsal in children who stutter. Developmental Science, *11*, 321-337. (PMCID: PMC2673811)
- Spencer, R. M. C.**, Gouw, A., & Ivry, R. B. (2007). Age-related decline of sleep-dependent consolidation. Learning and Memory, *14*, 480-484. (Public access: <http://learnmem.cshlp.org/content/14/7/480.long>)
- Schlerf, J., **Spencer, R. M. C.**, Zelaznik, H. N., & Ivry, R. B. (2007). Timing of rhythmic movements in patients with cerebellar degeneration. Cerebellum, *6*, 221-231.

- Spencer, R. M. C.,** Verstynen, T., Brett, M., & Ivry, R. B. (2007). Cerebellar activation during discrete and not continuous timed movements: an fMRI study. NeuroImage, *36*, 378-387.
- Verstynen, T., **Spencer, R. M. C.,** Stinear, C. M., Konkle, T., Diedrichsen, J., Byblow, W. D., & Ivry, R. B. (2007). Ipsilateral corticospinal projections do not predict congenital mirror movements: A case report. Neuropsychologia, *45*, 844-852. (PMCID: PMC2275211)
- Spencer, R. M. C.** & Ivry, R. B. (2007). The temporal representation of in-phase and anti-phase movements. Human Movement Science, *26*, 226-234.
- Spencer, R. M. C.,** Semjen, A., Yang, S., & Ivry, R. B. (2006). An event-based account of coordination stability. Psychonomic Bulletin and Review, *13*(4), 702-710.
- Spencer, R. M. C.,** Sunm, M., & Ivry, R. B. (2006). Sleep-dependent consolidation of contextual learning. Current Biology, *16*, 1001-1005.
- Spencer, R. M. C.,** Ivry, R. B., Cattaert, D. & Semjen, A. (2005). Bimanual coordination during rhythmic movements in the absence of somatosensory feedback. Journal of Neurophysiology, *94*, 2901-2910.
- Zelaznik, H. N., **Spencer, R. M. C.,** Ivry, R. B., Baria, A., Bloom, M., Dolansky, L., et al. (2005). Timing variability in circle drawing and tapping: Probing the relationship between event and emergent timing. Journal of Motor Behavior, *37*, 395-404.
- Spencer, R. M. C.,** Ivry, R. B., & Zelaznik, H. N. (2005). Role of the cerebellum in movements: control of timing or movement transitions? Experimental Brain Research, *161*, 383-396.
- Spencer, R. M. C.** & Ivry, R. B. (2005). Comparison of patients with Parkinson's disease or cerebellar lesions on continuous and discontinuous timing tasks. Brain and Cognition, *58*, 84-93.
- Weber-Fox, C., **Spencer, R. M. C.,** Spruill J. E., & Smith, A. (2004). Phonological processing in adults who stutter: electrophysiological and behavioral evidence. Journal of Speech, Language, and Hearing Research, *47*, 1244-1258.
Press: New York Times, among others
- Ivry, R. B. & **Spencer, R. M. C.** (2004). Evaluating the role of the cerebellum in temporal processing: Beware of the null hypothesis. Brain, *127*, e13.
- Spencer, R. M. C.,** Hazeltine, E., Semjen, A., & Ivry, R. B. (2004). Goal-based representation in repetitive bimanual movements. International Journal of Sport and Exercise Psychology, *2*, 239-254.
- Ivry, R. B. & **Spencer, R. M. C.** (2004). The neural representation of time. Current Opinions in Neurobiology, *14*, 225-232.
- Spencer, R. M. C.,** & Zelaznik, H. N. (2003). Weber (slope) analyses of timing variability in tapping and drawing tasks. Journal of Motor Behavior, *35*(4), 371-382.
- Spencer, R. M. C.,** Zelaznik, H. N., Diedrichsen, J., & Ivry, R. B. (2003). Disrupted timing of discontinuous but not continuous movements by cerebellar lesions. Science, *300*, 1437-1439.
Press: Why Files, Medical News Today, among others
- Weber-Fox, C., **Spencer, R. M. C.,** Cuadrado, E., & Smith, A. (2003). Development of neural processes mediating rhyme judgments: Phonological and orthographic interactions. Developmental Psychobiology, *43*, 128-145.
- Zelaznik, H. N., **Spencer, R. M.,** & Ivry, R. B. (2002). Dissociation of explicit and implicit timing in repetitive tapping and drawing movements. Journal of Experimental Psychology: Human Perception and Performance, *28*, 575-588.
- Zelaznik, H. N., **Spencer, R. M.,** & Doffin, J. (2000). Temporal precision in tapping and circle drawing movements at preferred rates is not correlated: Further evidence against timing as a general purpose ability. Journal of Motor Behavior, *32*(2), 193-199.
- Robertson, S. D., Zelaznik, H. N., Lantero, D. A., Bojczyk, K. G., **Spencer, R. M.,** Doffin, J. G., Schneidt, T. (1999). Correlations for timing consistency among tapping and drawing tasks: Evidence against a single timing process for motor control. Journal of Experimental Psychology: Human Perception and Performance, *25*, 1316-1330.

Book Chapters

- Spencer, R. M. C.** & Ivry, R. B. (in press). Cerebellum and Timing. In: D. Group (Ed.) Handbook on the Cerebellum and Cerebellar Disorders.
- Pace-Schott, & Spencer, R. M. C. (2011). Age-related changes in the cognitive function of sleep. In: A. Green (Ed.), Progress in Brain Research, Vol. 191 (pp. 75-89). New York: Springer. Amsterdam: Elsevier.
- Zelaznik, H. N., **Spencer, R. M. C.**, & Ivry, R. B. (2008). Behavioral Analysis of Human Timing. In: S. Grondin (Ed.), Psychology of Time. (pp. 233 – 260). Montreal: Emerald Press.
- Ivry, R. B., Diedrichsen, J., **Spencer, R. M. C.**, Hazeltine, E., & Semjen, A. (2004). A cognitive neuroscience perspective on bimanual coordination and competition. In S. Swinnen and J. Duysens (Eds.), Interlimb Coordination (pp. 259-295). Norwell, MA: Kluwer Academic Publishing.
- Ivry, R. B., **Spencer, R. M. C.**, Zelaznik, H. N., & Diedrichsen, J. (2003). The cerebellum and event timing. In S. M. Highstein and W. T. Thach (Eds.), The Cerebellum: Recent developments in cerebellar research, Annals of the New York Academy of Sciences, Vol. 978 (pp. 302-317). New York: New York Academy of Sciences.

Selected Recent Poster Presentations

- Baran, B. & **Spencer, R. M. C.** (2011, April) Sleep enhances emotional memory and protects emotional reactivity. Cognitive Neuroscience Society Annual Meeting. San Francisco, CA
- Kurdziel, L. & **Spencer, R. M. C.** (2010, November) Cognitive sequence learning following cerebellar damage. The Society for Neuroscience Annual Meeting. San Diego, CA.
- Karmarkar, U., Shiv, B., & **Spencer, R. M. C.** (2010, November) The impact of sleep on attribute recall and choice satisfaction. The Society for Neuroscience Annual Meeting. San Diego, CA.
- Pace-Schott, E., Karmarkar, U. & **Spencer, R. M. C.** (2010, August) Sleep-dependent modulation of decision-making. Gordon Research Conference: Neurobiology of Cognition, Waterville Valley, NH.
- Karmarkar, U. R., **Spencer, R. M. C.**, Shiv, B. (2009, September) Sleep related changes in attribute recall and choice. Presented at The Society for Neuroeconomics Annual Meeting, Evanston, IL.

Selected Platform Presentations

- Spencer, R. M. C.** (2011, June). Neural substrates of motor sequence learning and consolidation. Northeastern University. [Invited]
- Spencer, R. M. C. (2011, May). Sleep and memory in aging. National Institutes on Aging. [Invited]
- Spencer, R. M. C.** (2011, February). The function of sleep on learning across the lifespan. Michigan State University. [Invited]
- Spencer, R. M. C.** (2010, November). Optimizing the benefits of sleep on learning and memory. Presented at Learning and the Brain. Cambridge, MA. [Invited]
- Spencer, R. M. C.**, Bromfield, S., & Baran, B. (2010, May). Sleep-dependent modulation of emotional forgetting. Presented at Cognitive Neuroscience Society, Montreal, Quebec.
- Spencer, R. M. C.** (2009, October) Motor sequence learning in cerebellar patients is preserved with symbolic cues. Presented at Society for Neuroscience Annual Meeting, Chicago, IL. [Invited]
- Spencer, R. M. C.** (2009, October). Sleep and Memory: The case against pulling an all-nighter. Hope College (Holland, MI). [Invited]
- Spencer, R. M. C.** (2009, October). Neural control of motor sequence learning and consolidation. Purdue University. [Invited]
- Spencer, R. M. C.** (2009, February). Role of the cerebellum in event timing. Johns Hopkins University. [Invited]
- Spencer, R. M. C.** (2008, November). Sleep-dependent consolidation of motor skills. Harvard University. [Invited]

- Spencer, R. M. C.** (2007, January). How the cerebellum controls movement. University of California, Irvine, Department of Cognitive Sciences. [Invited]
- Spencer, R. M. C.,** Gouw, A., & Ivry, R. B. (2006, October). Age-related decrease in sleep-dependent consolidation. Society for Neuroscience Annual Meeting, Atlanta, GA.
- Spencer, R. M. C.** (2006, April). Sleep-dependent learning and consolidation of skill. University of California, Berkeley, Berkeley, CA. [Invited]
- Spencer, R. M. C.,** Ivry, R. B., & Semjen, A. (2005, June). A cognitive account of constraints on bimanual coordination. European Workshop on Movement Science, Vienna, Austria. [Invited]
- Spencer, R. M. C.** (2005, May). Influence of cognitive representations on movement timing and coordination. Max Planck Institute, Munich, Germany. [Invited]
- Spencer, R. M. C.** (2005, May). An event-based theory on movement timing and coordination. CNRS, University of the Mediterranean, Marseille, France. [Invited]
- Spencer, R. M. C.,** Verstynen, T., Brett, M., & Ivry, R. B. (2004, November). Cerebellar activation during discrete and continuous repetitive tapping movements. The Society for Neuroscience Annual Meeting, San Diego, CA
- Spencer, R. M. C.** (2004, April). The cerebellum and implicit learning. Veteran's Administration Hospital, Martinez, CA. [Invited]
- Spencer, R. M. C.** (2003, July). Specifying the cerebellar timing deficit. New York University, New York, NY. [Invited]

Professional Organizations

Sleep Research Society, Massachusetts Sleep Society, Society for Neuroscience, American Association for the Advancement of Science, Cognitive Neuroscience Society, Neural Control of Movement Society, New York Academy of Sciences, International Society for Motor Control

Other Professional Experience

Consulting editor: Journal of Motor Behavior

Ad-hoc review (among others): Acta Psychologica, Archives of General Psychiatry, Brain, Cerebellum, Cortex, Brain Research Bulletin, Developmental Science, European Journal of Neuroscience, Experimental Brain Research, Human Brain Mapping, Human Movement Science, International Journal of Sport and Exercise Psychology, Journal of Experimental Psychology: Human Perception and Performance, Journal of Cognitive Neuroscience, Journal of Gerontology: Psychological Science, Journal of Neurology, Journal of Neurophysiology, Journal of Neuroscience, Music and Perception, NeuroImage, Neuron, Neuropsychologia, PLoS ONE, Psychonomic Bulletin and Review, Science