

## Marie J. Hayes, Ph.D.

**Maine Institute for Human Genetics & Health**  
43 Whiting Hill Rd.  
Suite 150  
Brewer, ME 04412  
(207) 973-4963  
[mjhayes@emh.org](mailto:mjhayes@emh.org)

**University of Maine**  
Department of Psychology  
5742 Clarence Cook Little Hall  
Orono, ME 04469-5742  
(207) 581-2039  
[marie.hayes@umit.maine.edu](mailto:marie.hayes@umit.maine.edu)

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### ***CURRENT POSITIONS***

2010-present CEO, *Activas Diagnostics, LLC*

2005-present Professor, University of Maine

2006-present Allied Senior Research Scientist, Maine Institute for Human Genetics & Health, Eastern Maine Healthcare

2005-present Graduate School of Biomedical Sciences, Neuroscience Track

2007- present Founder and director, Maine Neurogenetics Consortium

2010-present Chair and founder, Maine Chapter of the Society for Neuroscience

1993-present Allied Research Scientist, Divisions of Pediatrics, Psychiatry and Family Medicine, Eastern Maine Medical Center and Eastern Maine Healthcare Systems

### ***RECENT AWARDS***

2010 Outstanding Professor for Research and Creative Activity, College of Liberal Arts & Sciences, University of Maine

2007 Trustee Professorship, University of Maine System

### ***EDUCATION***

1979-1980 Postdoctoral Fellow in Clinical Neuropsychopharmacology, Department of Psychiatry, Boston University School of Medicine

1974-1979 M.A., Ph.D., Experimental Psychology, Northeastern University

1969-1973 B.A., *Magna cum Laude*, Boston College.

### ***FORMER POSITIONS***

- 2007-2008     Consultant, Phillips Respironics Corporation
- 1997-2005     Associate Professor of Psychology, University of Maine
- 1991-1997     Assistant Professor of Psychology, University of Maine
- 1988-1990     Instructor in Psychology, University of Maine
- 1986-1987     Allied Research Scientist, Division of Neonatology, Hospital of the  
University of Pennsylvania
- 1983-1986     Instructor in Psychology and Program in the Biological Basis of Behavior,  
University of Pennsylvania

### ***PUBLICATIONS***

Hayes, M.J., McCoy, S.K., DiPietro, J.A., Fukumizu, M. & Joseph D. Wellman. (in press). Temperament and sleep-wake behaviors from infancy to toddlerhood. *Infant & Child Development*.

Falkner, T., Abedi, A., Hayes, M.J. Paul, J.A. (2010). Improving the signal to noise ratio of event-related EEG signals in high risk newborns. *Proceedings of IEEE Queens Biennial Symposium on Communications (QBSC)*, Kingston, ON, May 2010, pp. 28-31. [doi:10.1109/BSC.2010.5473008](https://doi.org/10.1109/BSC.2010.5473008)

Matano, B.A., Hayes, M.J., Brown, M., Tisher, P., Krishnan R. and Paul, J.A. (2009) .Maine's high risk infants and maternal health and wellbeing. *Maine Policy Review: Special Issue on Early Childcare, 18, 60-67*.

Troese, M., Fukumizu, M., Sallinen, B.J., Gilles, A.A., Wellman, J.D., Paul, J.A., Brown, E.R., & Hayes, M.J. (2008). Sleep fragmentation and evidence for sleep debt in alcohol-exposed infants. *Early Human Development, 84, 577-585*.

Hayes, M.J., Akilesh, M.R., Fukumizu, M. Gilles, A.A., Sallinen, B. A., Troese, M. & Paul, J.A. (2007). Apneic preterms and methylxanthines: Arousal deficits, sleep fragmentation and suppressed spontaneous movements. *Journal of Perinatology, 27, 782-789*.

Sallinen, B.J., Gilles, A.A. & Hayes, M.J. (2007). Psychobiological and cultural factors in the development of postpartum depression. In A. Rosenfeld (Ed.), *New Research in Postpartum Depression* (pp. 3-27). New York, NY: Nova Science Publishers

Giganti F., Hayes, M.J., Cioni, G. & Salzarulo, P. (2007). Yawning frequency and distribution in preterm and near term infants assessed throughout 24-h recordings. *Infant & Child Development*, 30, 641-647.

Hayes, M.J., Fukumizu, M., Troese, M., Sallinen, B.J. & Gilles, A.A. (2007). Social experiences in infancy and early childhood co-sleeping. *Infant & Child Development*, 16, 403-416..

Hayes, M.J., & Fukumizu, M. (2006). The human neonate. In N. J. Salkind (Ed.), *Encyclopedia of Human Development* (pp. 902-903). Thousand Oaks, CA: SAGE Publications.

Fukumizu, M., Kaga, M., Kohyama, J. & Hayes, M.J. (2005). Sleep-related nighttime crying (“yonaki”) in Japan. *Pediatrics*. 115, 217-224

Hayes, M. J., Brown, E., Hofmaster, P., Davare, A., Parker, K. G., & Raczek, J. A. (2002). Prenatal alcohol intake in a rural, Caucasian clinic. *Family Medicine*, 34(2), 120-125.

Symanski, M.E., Hayes, M.J., & Akilesh, M.K. (2002). Patterns of premature newborns’ sleep-wake states before and after nursing interventions on the night shift. *Journal of Obstetrics and Gynecological Neonatal Nursing*, 31, 305-313.

Giganti, F., Hayes, M. J., Akilesh, M. R., & Salzarulo, P. (2002). Yawning and behavioral states in preterm infants. *Developmental Psychobiology*, 41, 289-296.

Hayes, M. J. (2002). Methodological issues in the study of arousal and awakening in infants. *Advances in Consciousness Research*, Vol. 38. Salzarulo, P. & Ficca, G. (Eds.), *Awakening and Sleep-Wake Cycle across Development*, pp. 23-45.

Hayes, M. J., Parker, K. G., Sallinen, B., & Davare, A. (2001). Bedsharing, temperament and disturbance in early childhood. *Sleep*, 24, 657-662.

Hayes, M.J., Roberts, S., & Davare, A.A. (2000). Transactional conflict between psychobiology and culture in the etiology of postpartum depression, *Medical Hypothesis*, 54, 7-17.

Hayes, M.J. (1999). A review of "The lifespan development of individuals: Behavioral, neurobiological, and psychosocial perspectives by D. Magnusson (Ed.)." Cambridge University Press, 1996. *Human Ethology Bulletin*, 14(1), 20-22.

Hayes, M. J., & Mitchell, D. (1998). Spontaneous movements during sleep: Temporal organization and changes with age. *Developmental Psychobiology*, 32, 13-21.

Hayes, M. J. (1998). Review of "Experimental Psychology, Methods of Research" by F. J. McGuigan. Prentice Hall, 1997. *Journal of Mind and Behavior*, 19, 103-104.

Hayes, M.J., Smith, B.A., Herrick, S.E., Roberts, S. M., & Swanson, E. (1997). Motoric responses to sucrose differ in postmature and term infants. *Physiology & Behavior*, 61, 101-106.

Hayes, M.J., & Roberts, S.M., and Stowe, R. (1996). Early childhood co-sleeping: Parent-child and parent-infant night-time interactions. *Infant Mental Health Journal*, 17(4), 348-357.

Rosenwasser, A.M., & Hayes, M.J. (1995). Neonatal desipramine treatments alters free-running circadian drinking rhythms in rats. *Psychopharmacology*, 115, 237-244.

Hayes, M.J., Plante, L., Fielding, B.A., Kumar, S.P., & Delivoria-Papadopoulos, M. (1994). Functional analysis of spontaneous movements in preterm infants. *Developmental Psychobiology*, 27, 271-287.

Hayes, M.J., Kumar, S.P., Plante, L., & Delivoria-Papadopoulos, M. (1993). Spontaneous motility in premature infants: Features of behavioral activity and rhythmic organization. *Developmental Psychobiology*, 26, 279-291.

Block, M.L., Volpe, L.C., & Hayes, M.J. (1981). Saliva as a chemical cue in the ontogeny of social behavior. *Science*, 211, 1062-1064.

Miller, L.H., Kastin, A.J., Hayes, M.J., Sterste, A., Garcia, J., & Coy, D.H. (1981). Inverse relationship between onset and duration of EEG effects of six peripherally administered peptides. *Pharmacology, Biochemistry, and Behavior*, 15, 845-848.

#### Under Review

Paul, J.A., Krishnan, R., Matano, B.A., Brown, M., Tisher, P., Heller, N. A., Troese, M. & Hayes, M.J.(submitted). Neurocognition and auditory neural processing in newborns prenatally exposed to methadone.

Sallinen, B.J., Wellman, J.D., Fukumizu, M., Gilles, A.A., Troese, M. & Hayes, M.J. (submitted). Parenting the clinically anxious child: Dyadic interactions during play and mild stress.

**GRANT FUNDING (\*Awarded)**

- 2010 **\*PI, Maine Technology Institute.** Pre-Phase II Award, “Commercialization Plan for Activas Diagnostics” (8/30/10, \$10,000).
- 2010 **\* PI, Phase 1, Small Business Innovation Research.** “Prototype Sleep Movement Device and Traumatic Brain Injury.” Telemedicine & Advanced Technology Research Center, Department of Defense (awarded, 6/2/2010) \$100,000).
- 2009 **NIH, NCRR.** Subcontract entitled “Development And Validation of Rural And Family Lifestyle Questionnaire For Maine Family BioGeoBank.” JA Hock, PI, Center for Biomedical Research Excellence, Maine Institute for Human Genetics & Health (submitted, 4/27/09, not awarded, resubmission planned).
- 2009 **PI, NIDA, RC1 Competition.** “Opiate Withdrawal in the Neonate Using Proteomic and Genomic Strategies. (submitted, 4/27/09, resubmission as RO1, 2/15/10)
- 2009 **Consultant,** Phase 2 SBIR DoD proposal of Franz Huber to address cognitive loss in brain injured patients (awarded).
- 2009 **\*PI, NIH, DA024806.** “Sleep, Arousal, and Spontaneous Movements in Opioid Exposed Infants” (awarded, 6/30/09-11, \$337,000).
- 2009 **NASA SG-09-25** Summer research assistants (2), Maine NASA Consortium (\$6,000).
- 2008 **\*Co-PI. NASA.** “Improving the Signal to Noise Ratio of Event-Related EEG Signals in High Risk Newborns” (awarded, 7/1/08, \$5,000).
- 2007 **\*PI, Department of Defense.** “Posttraumatic Stress Disorder in Siblings of Pediatric Cancer Patients” (awarded, 2007-2010, \$447,000)
- 2005 **\* Co-PI, ,Maine Academic Prominence Initiative,** Office of the Provost, University of Maine (\$150,000). Re-awarded competitively 7-1-2007 for \$50,000/ year. Last installment: 6/2010.
- 2007 **\*PI, *Respironics* contract #2531-01,** “SIDS and Sleep-Related Motility in Infants” (awarded, \$20,000).
- 2007 **\*PI, Maine Economic Improvement Fund,** “Neuroscience at Maine Institute of Human Genetics & Health” (awarded, \$20,000).

- 2003 \***Visiting Scholar Grant** to bring M. Fukumizu, M.D., Ph.D. from Tokyo, Japan. Office of Research, University of Maine (4/1/03-4/1/06, \$55,000 per year).
- 2003 \***Scientific Equipment and Book Fund**, "Neurophysiological Equipment for a SIDS study in Premature Infants," University of Maine (\$10,000).
- 2003 \***Eastern Maine Medical Center**. "SIDS and Apnea in Premature Infants" (\$2500).
- 2003 **PI**, subcontract "Prenatal Alcohol Effects: Infant Followup Project" seeded by the Children at Risk Project, Project PI K. Oller, HRSA (\$27,000).
- 1998 \***Scientific Equipment and Book Fund**. "Neurobehavioral Indices of CNS Infarct in the Premature Infant," University of Maine (\$10,000).
- 1998 \***Eastern Maine Medical Center**. "Theophylline and Caffeine Pharmacotherapy Affects Sleep and Waking States in Premature Infants," (Research assistant award: \$7,000).
- 1995 \***Women in the Curriculum Grant**. "Postpartum Depression." (\$15,000).
- 1993 \***Tempur Pedic, Nion Corporation**. "A study of Sleep Disorders in Children and Treatment with a Specialized Mattress Surface."(\$10,000)
- 1993 \***Summer Faculty Research Grant** "Ontogeny of Sleep Movements in Preterm Infants and Children: Relationship to REM Sleep Activation" University of Maine. (\$15,000).

*Ongoing New Projects*

- 2010 **Provisional patent application** submission for sleep device for early detection of brain injury 12/20/2009. Inventor: MJ Hayes, Co-Inventor: Ali Abedi.
- 2010 **Activas Diagnostics, Inc.** . CEO: MJ Hayes. Business incorporated as part of my lab's SBIR program.
- 2010 **Congressional Appropriations request** for early detection of brain injury with Ali Abedi, PhD (\$1,000,000).
- 2010 "**Genetic methylation studies of opiate addiction in maternal infant dyads.**" Collaboration with D.Nielsen, Ph.D., neurogeneticist, Baylor College of Medicine. IRB approval,

- 2009 “**Alternative Therapy Methods for PTSD Treatment in Returning Veterans.**” In collaboration with Togus Office for Research and Dr.R. Causey, Ph.D, University of Maine. IRB approval received 4/09.
- 2009 “**Prodromal Schizophrenia: Impairment in Memory Consolidation and Relationship to Sleep**” in collaboration with Robert Stickgold and Dara Manoach, Harvard, and Jessica Pollard, UMaine adjunct Professor and psychologist, Acadia Hospital, EMHS.
- 2010 **Co-PI** on multisite clinical trial in collaboration with Dr. Mark Brown and Chief of Neonatology, Dr. J. Davis, Tufts University Medical School. “Comparison of Methadone vs. Morphine in NAS Treatment.” RO1 submission planned for 2/2011.

***SCIENTIFIC PRESENTATIONS, PUBLISHED ABSTRACTS (partial list)***

- J.M. Pollard, D.S. Manoach, M.J. Hayes, and R. Stickgold. (accepted) Sleep dependent memory consolidation in prodromal and first episode schizophrenia. International Early Psychosis Association, Amsterdam, Netherlands.
- M.J. Hayes (2010). Movement and early sleep development. Invited lecture for the Israeli Science Foundation meeting of “Motor and Sleep Development”, Haifa University, Haifa, Israel. Invited with travel expense paid.
- M. J. Hayes, J. A. Paul, R. Krishnan, B. A. Matano, M. Troese, M. Fukumizu, M. Brown, P. Tisher, , J. Pelletier. (2010). Neurodevelopment of the prenatal opiate dependent human neonate: Auditory recognition memory and sleep, arousal, and movements during withdrawal. College of Problems of Drug Dependence, Scottsdale, Arizona.
- Logan, B.A., Paul, J.A., Heller, N.A., Krishnan, R, Troese, M. & Hayes, M.J. (2010). Prenatal alcohol exposure in infants of methadone treated women. Research Society for Alcoholism, San Antonio, Tx.
- Sigmon, S.T., Hayes, M., Matano, B., Lodis, C., Alderfer, M., & Hock, J. (2009). Risk and resiliency factors in the development of posttraumatic stress in the well siblings of children with cancer. Poster presented at the annual meeting of the Association of Behavioral and Cognitive Therapies, New York, NY.
- Matano, B.A., Heller, N.A., Paul, J.A., Krishnan, R. & Hayes, M.J. (2009). Sleep, arousal and spontaneous movements in neonates of opiate addicted women. International Society for Developmental Psychobiology, Chicago, IL.
- Paul, J.A., Krishnan, R., **Matano, B.A.**, Heller, N.A. & Hayes, M.J. (2009) Sleep

and neurocognition in neonates prenatally exposed to opioids. International Society for Developmental Psychobiology, Chicago, IL.

Matano, B.A., Heller, N.A., Paul, J.A., Krishnan, R. & Hayes, M.J. (2009). Sleep, arousal and spontaneous movements in neonates of opiate addicted women. MBMSS, Bar Harbor, Maine.

Matano, B.A., Heller, N.A., Paul, J.A., Krishnan, R. & Hayes, M.J. (2009). Sleep, arousal and spontaneous movements in neonates of opiate addicted women. Graduate Student Research Exposition, Orono, Maine.

Paul, J., Krishnan, R., Hayes, M., & Matano, B. (2008). Assessment of irritability and limb activity during opioid withdrawal in newborns with prenatal methadone exposure. MBMSS, Bar Harbor, Maine.

Krishnan, R., Paul, J.A., Brown, M., Tisher, P., & Hayes, M.J. (2009). Auditory neural processing in newborns prenatally exposed to methadone (May, 2009). Pediatric Academic Societies, 2009, Baltimore, MD.

Hayes, M.J. and Fukumizu, M. (2009). Sleep Development in Infancy and Early Childhood in Two Societies: Japan and the United States. Invited oral presentation. (April, 2009). Society for Research in Child Development, 2009, Denver, CO.

Krishnan, R., Paul, J.A., Brown, M., Tisher, P., & Hayes, M.J. 2009. Auditory neural processing in newborns prenatally exposed to methadone. Pediatric Academic Societies, Baltimore, MD.

Hayes, M.J. and Fukumizu, M. (2009). Sleep development in infancy and early childhood in two societies: Japan and the United States. Invited oral presentation. Society for Research in Child Development, Denver, CO.

Sigmon, S.T., Hayes, M.J., Matano, B., Lodi, C., Alderfer, M., & Hock, J. (2009). Risk and resiliency factors in the development of posttraumatic stress in the well siblings of children with cancer. Association of Behavioral and Cognitive Therapies, New York, NY.

Matano, B.A., Heller, N.A., Paul, J.A., Krishnan, R. & Hayes, M.J. (2009). Sleep, arousal and spontaneous movements in neonates of opiate addicted women. International Society for Developmental Psychobiology, Chicago, IL.

Paul, J.A., Krishnan, R., Matano, B.A., Heller, N.A. & Hayes, M.J. (2009) Sleep and neurocognition in neonates prenatally exposed to opioids. International Society for Developmental Psychobiology, Chicago, IL.



Hayes, M.J., Paul, J.A., Matano, B.A., Heller, N.A. and Krishnan, R. (2009). Sleep and neurocognition in neonates prenatally exposed to opioids Society for Neuroscience, Chicago, IL. (\*Selected out of 400 sleep-themed abstracts for oral presentation at Sleep and Circadian Rhythms Data Blitz).

Matano, B.A., Heller, N.A., Paul, J.A., Krishnan, R. & Hayes, M.J. (2009). Sleep, arousal and spontaneous movements in neonates of opiate addicted women. MBMSS, Bar Harbor, Maine.

Paul, J., Krishnan, R., Hayes, M., & Matano, B. (2008). Assessment of irritability and limb activity during opioid withdrawal in newborns with prenatal methadone exposure. MBMSS, Bar Harbor, Maine.

N.A. Heller, B.A. Logan, J.A. Paul, R. Krishnan, M. Brown, P. Tisher, M. Troese and M. J. Hayes. (2010). Outcome for infants of women in methadone maintenance treatment: Maternal substance abuse, socioeconomic & psychiatric status. International Society for Infant Studies. Baltimore, MD.

Hayes, M.J., Paul, J.A., Krishnan, R., Troese, M., Fukumizu, M., Brown, M., Tisher, P., Matano, B., & Pelletier, J. Neurodevelopment of the prenatal opiate dependent human neonate: auditory recognition memory and sleep, arousal, and movements during withdrawal. (2008 November). Society for Neuroscience, 2008, Washington, D.C.

Hayes, M.J., Paul, J.A., Krishnan, R., Troese, M., Fukumizu, M., Brown, M., Tisher, P., Matano, B., & Pelletier, J. Neurodevelopment of the prenatal opiate dependent human neonate. (2008 November). International Society for Developmental Psychobiology, 2008, Washington, D.C.

Hayes, M.J., Troese, M., Fukumizu, M., Paul, J.A., Krishnan, R., Akilesh, M., Brown, M., Tisher, P., Matano, B., & Logan, R. Spontaneous movements during sleep in three high SIDS-risk samples: alcohol-exposed infants, apneic preterms and opiate exposed infants. (2008 April). Maine Biological and Medical Sciences Symposium, Salisbury Cove, ME.

Paul, J.A., Matano, B., Krishnan, R., & Hayes, M.J. Assessment of irritability and limb activity during opioid withdrawal in newborns with prenatal methadone exposure. (2008 April). Maine Biological and Medical Sciences Symposium, Salisbury Cove, ME.

Hayes, M.J., Troese, M., Fukumizu, M., Paul, J.A., Krishnan, R., Akilesh, M., Brown, M., Tisher, P., Matano, B., & Logan, R. Spontaneous movements during sleep in three high SIDS-risk samples: alcohol-exposed infants, apneic preterms and opiate exposed infants. (2007 November). International Society for Developmental Psychobiology, San Diego, CA.

Hayes, M.J., Troese, M., Fukumizu, M., Paul, J.A., Krishnan, R., Akilesh, M., Brown, M., Tisher, P., Matano, B., & Logan, R. Spontaneous movements during sleep in three high SIDS-risk samples: alcohol-exposed infants, apneic preterms and opiate exposed infants. (2007 November). Society for Neuroscience, San Diego, CA.

Ramesh, K., Troese, M., Paul, J.A., Matano, B., Brown, M.S., Tisher, P.W., & Hayes, M.J. Auditory event related potential features in neonates prenatally exposed to methadone. (2007 April). Society for Research in Child Development. Boston, MA.

Hayes, M.J. Sleep, arousal and sleep movements in alcohol-exposed infants compared to apneic and other SIDS high risk samples. (2007, April). Maine Biological and Medical Sciences Symposium, Salisbury Cove, ME.

Troese, M., Gilles, A. A., Sallinen, B.J., Fukumizu, M., Brown, E., & Hayes, M.J. Neonatal sleep in infants with prenatal alcohol exposure. (2006, October). International Society of Developmental Psychobiology, Atlanta, GA.

Hayes, M. J., Akilesh, M. R., Gilles, A. A., Fukumizu, M., Sallinen, B.J., & Troese, M. Arousal deficits in apneic premature infants treated with theophylline and caffeine. (2006, October). International Society of Developmental Psychobiology, Atlanta, GA.

Fukumizu, M., Hayes, M. J., Kaga, M. & Kohyama, J. (2006, June). Sleeping environments during infancy in Japan. 9th International SIDS Conference. Yokohama, Japan.

Troese, M., Hayes, M.J., Sallinen, B.J., Gilles, A.A., & Fukumizu, M. Infant temperament and sleep habits following prenatal alcohol exposure. (2006, June). Research Society on Alcoholism. Baltimore, MD.

Hayes, M.J., DiPietro, J.A., Atella, L., Sallinen, B.J., Gilles, A.A., Troese, M., Cobo-Lewis, A., & Fukumizu, M. (2006, March) Sleep-Wake Behavior: Neonate to the Second Year. Pediatric Sleep Medicine Conference. Amelia Island, Jacksonville, FL

Fukumizu, M., Hayes, M.J., Sallinen, B.J., Gilles, A.A., & Troese, M. (2006, March) Infant Sleep and Night Waking: A cross-cultural approach to educating the medical community. Pediatric Sleep Medicine Conference, Amelia Island, Jacksonville, FL

Lolar, R.M., Paul, J.P., Troese, M., Gilles, A.A., Wellman, J.D., Sallinen, B.J., Akilesh, M., Fukumizu, M., & Hayes, M.J. (2005, October) Sleep, actigraphy and

behavioral state in premature infants receiving theophylline and caffeine. 8th Annual Symposium of the Center for Neuroendocrine Studies. Amherst, MA

Higgins, A., Wojtal, E., Wellman, J.D., Troese, M., Gilles, A.A., Sallinen, B.J., Fukumizu, M., Brown, E., & Hayes, M.J. (2005, October) Prenatal alcohol exposure: neonatal sleep and spontaneous movements. 8th Annual Symposium of the Center for Neuroendocrine Studies. Amherst, MA

Hayes, M. J., DiPietro J. A., Atella, L., Sallinen, B. J., Gilles, A. A., Troese, M., Cobo-Lewis, A. B., & Fukumizu, M. (2005, April). Sleep-wake behavior from the neonatal period to the second year. Poster presented at the biennial meeting of the Society for Research in Child Development, Atlanta, Georgia.

Gilles, A. A., Troese, M., Hayes, M. J., Akilesh, M. R., & Fukumizu, M. (2005, April). Theophylline and caffeine alter behavioral state in premature infants. Poster presented at the biennial meeting of the Society for Research in Child Development, Atlanta, Georgia.

Sallinen, B. J., Hayes, M. J., Troese, M., Gilles, A. A., & Fukumizu, M. (2005, April). The role of temperament and parent-child interactions in the development of childhood social anxiety disorder. Poster presented at the biennial meeting of the Society for Research in Child Development, Atlanta, Georgia.

Troese, M., Gilles, A. A., Sallinen, B. J., Fukumizu, M., Brown E. R., & Hayes, M. J. (2005, April). Neonatal sleep and responsiveness following prenatal alcohol exposure. Poster presented at the biennial meeting of the Society for Research in Child Development, Atlanta, Georgia.

Gilles, A. A., Sallinen, B. J., Troese, M., Fukumizu, M., Brown, E., & Hayes, M.J. (2004, June). Neonatal sleep and spontaneous movements following prenatal alcohol exposure. Poster presented at the annual meeting of the Research Society on Alcoholism, Vancouver, British Columbia, Canada.

Fukumizu, M., Kaga, M., Kohyama, J. & Hayes, M.J. (2004). Sleep-related nighttime crying (Yonaki) in Japan: Status as sleep problems and influences on mothers. Association of Professional Sleep Societies. Philadelphia, PA.

Hayes, M.J., DiPietro, J.A., Atella, L., Sallinen, B.J., Gilles, A.A., Cobo-Lewis, A. & Fukumizu, M. (October 5, 2004). Sleep-wake behavior from the neonatal period to the second year. Invited oral presentation to the 14th Annual Meeting of the Pediatric Sleep Satellite of the European Sleep Research Society, Prague, Czech Republic.

Hayes, M.J., Dipietro, J.A., L. Atella, Sallinen, B.J., Gilles, A.A., Cobo-Lewis, A. & M. Fukumizu. (2004). Continuity and discontinuity of sleep-wake behavior:

neonatal period to the second year. Selected oral presentation for the Association for Professional Sleep Societies, Philadelphia, PA.

Fukumizu, M., Kaga, M., Kohyama, J. & Hayes, M.J. (2004). Sleep-related nighttime crying (Yonaki) in Japan: Status as sleep problems and influences on mothers. Association of Professional Sleep Societies. Philadelphia, PA.

Gilles, A.A., Sallinen, B.J., Troese, M., Fukumizu, M., Brown, E. & Hayes, M.J. (2004). Neonatal sleep and spontaneous movements following prenatal alcohol exposure. Research Society on Alcoholism, Vancouver, British Columbia.

Sallinen, B. J., & Hayes, M. J. (2003). Symptoms of social phobia and agoraphobia in late adolescence: Childhood family environment and history of behavioral inhibition. Abstract accepted at the annual meeting of the Association for the Advancement of Behavior Therapy, Boston, MA.

Hayes, M. J., Dipietro, J. A., Atella, L., Sallinen, B. J., & Gilles, A. (2003). Temperament and sleep-waking behavior in the neonate and toddler. Association of Professional Sleep Societies. Chicago, IL.

Hayes, M. J., Sallinen, B. J., Gilles, A., Stoughton, J., Zeman, J., & Brown, E. (2003). Prenatal alcohol: Neonatal sleep organization and spontaneous movements. Association of Professional Sleep Societies. Chicago, IL.

Sallinen, B. J., Hayes, M. J., & Gilles, A. (2003). History of behavioral inhibition and family environment factors influences development of social phobia in adolescence. Society for Research in Child Development. Tampa, FL.

Scher, A. & Hayes, M. J. (2003). Motor activity during the night and temperament. Society for Research in Child Development, Tampa, FL., April, 2003.

Sallinen, B. J., & Hayes, M. J. (2002). The role of behavioral inhibition in the development of social phobia during the transition from high school to college. Association for the Advancement of Behavior Therapy. Reno, NV.

Sallinen, B.J., Hayes, M.J., Nesin, A. & Zeman, J. (2002). Infant fussiness and maternal psychosocial well-being. International Conference of Infant Studies. Toronto, ON.

Hayes, M.J., Sallinen, B.J., Gilles, A., Zeman, J., Nathani, S., Nesin, A., Toothaker, M., & Booth, A. (2002). Infant sleep and arousal following prenatal alcohol exposure. International Conference of Infant Studies. Toronto, ON.

Hayes, M. J., Sallinen, B. G., Parker, K. G., & Davare, A. (2001). Bedsharing, temperament and sleep disturbance in early childhood. Society for Research in Child Development, Minneapolis, MN.

Hayes, M.J. (2000). Methodological issues in awakening studies. Pediatric Wake-Up Club, Florence, Italy.

Hayes, M.J., Akilesh, M., Davare, A., & Parker, K.G. (1999). Comparison of theophylline and caffeine pharmacotherapy on behavioral state and spontaneous movements in infants between 30-35 weeks PCA. World Federation of Sleep Research Society, Dresden, Germany.

Hayes, M.J., Parker, K.G., & Davare, A.A. (1999). Temperament predicts bedsharing in preschool-aged children. Association of Professional Sleep Societies, Orlando, FL.

Hayes, M.J., Akilesh, M., Davare, A., & Parker, K.G. (1999). Theophylline and caffeine alter behavioral state and the temporal properties of movement in premature infants. Association of Professional Sleep Societies, Orlando, FL.

Hayes, M.J., Kumar Akilesh, K., & Davare, A (1999). Theophylline and caffeine alter movement patterning and behavioral state in premature infants. The Physical and Developmental Environment of the High-Risk Infant, Clearwater, FL.

Hayes, M.J., Davare, A., & Alikesh, K. (1999). Theophylline and sleep-wake behavior in premature infants. Developmental and Environmental Influences on the High Risk Infant Conference, Clearwater, FL.

Boulard, N., Hayes, M.J., Piper, B.S., & Raczek, J.P. (1998). Social and familial influences on maternal substance use patterns. American Psychological Association, New Orleans, LA.

Hayes, M.J., Piper, B., Cronin, J.L., & Wirth, F. (1998). Theophylline and caffeine: Movement patterning and behavioral state in premature infants. Biennial International Conference of Infant Studies, Atlanta, GA.

Hayes, M.J. (1998). Organized and chaired a symposium entitled "Emergence of motor organization in the fetus and neonate: Congruent themes in animal and human models." Biennial International Conference of Infant Studies, Atlanta, GA.

Piper, B.J., & Hayes, M.J. (1998). Temperament factors in cosleeping among preschoolers. Eastern Psychological Association, Boston, MA.

- LoCicero, A., Hayes, M.J., Isokson, D., & Finkel, M. (1998). Facilitating the development of mothers: Essential support for the biopsychosocial transition to motherhood. Society for Research in Adult Development, Montpelier, VT.
- Hayes, M.J., & Herrick, S. (1997). Distribution and organization of motor activity during sleep in school-aged children. Biennial Meeting of the Society for Research in Child Development, Washington, D.C.
- Hayes, M.J., Piper, B., & Raczek, J. (1997). Maternal patterns of drug use in a prenatal sample: Implications for postnatal development. Maine Biological and Biomedical Sciences Symposium, Colby College, Waterville, ME.
- Hayes, M.J., Piper, B., Cronin, J.L., & Wirth, F. (1997). Effects of methylxanthines on motor behavior and sleep in premature infants. International Society for Developmental Psychobiology, New Orleans, LA.
- Hayes, M.J. (1996). Evidence for behavioral organization in spontaneous movements during sleep. International Society for Developmental Psychobiology, Washington, D.C.
- Hayes, M.J., Smith, B.A., Roberts, S.M., Swanson, E., & Herrick, S. (1996). Differential activation of a primitive feeding system between term and postmature infants in the sucrose calming test. Biennial International Conference of Infant Studies, Providence, RI.
- Hayes, M.J. (1996). Developmental changes in the temporal organization of spontaneous movements during sleep. Annual Maine Biological and Medical Sciences Symposium, Orono, ME.
- Rosenwasser, A.M, Dwyer, S.M, & Hayes, M.J. (1996). Neonatal clomipramine treatment alters circadian rhythms and alcohol intake in adulthood. Society for Neuroscience, Washington, D.C.
- Hayes, M.J., & Roberts, S.M. (1995). Comparison of sleep-related movements in children measured by actigraphy and video analysis. Annual Maine Biological and Medical Sciences Symposium, Jackson Laboratories, Bar Harbor, ME.
- Hayes, M.J., Smith, B.A., Herrick, S.E., & Swanson, E. (1995). Behavioral differences between term and postmature infants to the sucrose calming test. Biennial Meeting of the Society for Research in Child Development, Indianapolis, IN.
- Hayes, M.J., & Roberts, S.M. (1995). Ontogeny of spontaneous movements during sleep. *Sleep Research*, 24A, 182. World Federation of Sleep Research Societies, Nassau, The Bahamas.

- Hayes, M.J., & Roberts, S. (1995). Comparison of sleep-related movements in children measured by actigraphy and video analyses. Maine Biological and Medical Sciences Symposium, Bar Harbor, ME.
- Hayes, M.J., Stowe, R., Emerson, K., Morris, R., & Roberts, S. (1995). Co-sleeping in preschool children: Relationship to sleeping disorders. Eastern Psychological Association, Boston, MA.
- Rosenwasser, A.M., & Hayes, M.J. (1993). Neonatal desipramine treatment alters the period and amplitude of free-running circadian drinking rhythms. International Society for Chronobiology, Quebec, Canada.
- Hayes, M.J., Spreitzer, H., & Terman, M. (1994). Spontaneous motor activity is affected by sleep surface quality in children. *Sleep Research*, 23, 126. Association of Professional Sleep Societies, Boston, MA.
- Hayes, M.J. (1994). Postpartum depression. Women, Race and Class Convention, University of Maine, Orono, ME, April, 1994.
- Hayes, M.J., & Plante, L. (1993). Qualitative and quantitative aspects of spontaneous motor activity during sleep in children younger than 10 years of age. Paper presented at the International Society for Developmental Psychobiology, Alexandria, VA.
- Hayes, M.J. (1992). Spontaneous movements during sleep in preterm infants. Maine Biological and Biomedical Sciences Symposium, Biddeford, ME.
- Hayes, M.J., Kumar, S.P., & Delivoria-Papadopoulos, M. (1992). Movement patterns related to state in preterm infants. International Society for Developmental Psychobiology, Long Beach, CA.
- Rosenwasser, A.M., & Hayes, M.J. (1992). Early desipramine exposure alters circadian rhythms in rats. *Society for Neuroscience Abstracts*, 18, 1226.
- Hayes, M.J., Kumar, S.P., Plante, L., & Delivoria-Papadopoulos, M. (1991). Spontaneous movements in healthy preterm infants: Temporal organization and changes with age. Third International Brain Research Organization World Congress of Neuroscience, Montreal, Canada.
- Hayes, M.J., Kumar, S.P., Plante, L., & Delivoria-Papadopoulos, M. (1990). Rhythmic organization of spontaneous movements in premature infants less than 34 weeks gestational age. Annual Meeting, Society for Research on Biological Rhythms, Jacksonville, FL.

Hayes, M.J., & Block, M.L. (1983). Preference for maternal saliva cues during weaning in the gerbil. Annual Meeting, International Society for Developmental Psychobiology, Hyannis, MA.

Miller, L.H., Hayes, M.J., & Kastin, A.J. (1980). Electrographic correlates of peptide administration in the rat. Winter Neuropeptide Conference, Breckenridge, Colorado.

Hayes, M.J., & Block, M.L. (1978). Chinning behavior of the developing Mongolian gerbil directed to the dam: A novel behavioral contribution to the weaning process? Annual Meeting, Eastern Psychological Association, Washington, D.C.

Hayes, M.J., & Block, M.L. (1976). Harderian gland secretions: Pheromonal control of social behavior in gerbils (*Meriones unguiculatus*). Animal Behavior Society, Boulder CO.

### ***SERVICE TO THE PROFESSION***

#### **Ad Hoc Review for:**

*Alcoholism: Clinical & Experimental Reports*

*Sleep*

*Pediatrics*

*Pediatric Research*

*European Journal of Pediatrics*

*Child Psychology and Psychiatry*

*Behavioral and Brain Sciences*

*Behavioral and Brain Functions*

*Developmental Psychobiology*

*Developmental Psychology*

*Early Human Development*

*International Journal of Behavioral Development*

*Neuroscience Letters*

*Physiology & Behavior*

*Infant & Child Development*

*Child: Care, Health & Development*



*Journal of Family Psychology*

*Journal of Mind and Behavior*

*Journal of Aging Research*

*Brain & Development*

**Other Service to the Profession:**

National Science Foundation, ad hoc reviewer, multiple submissions

Civilian Research and Development Foundation, proposal reviewer

Society for Research in Child Development, 2008, 2010 reviewer

United Kingdom, Health Institutes, grant reviewer

Department of Defense, grant reviewer, multiple submissions

Human Development Conference, Infancy submissions

Maine Biomedical & Behavioral Sciences Symposium, Behavior Section

McGraw Hill Publishers, textbook editor

Worth Publishers, textbook editor

**Recent Senior Mentorship:**

**Bethany A. Sallinen, Ph.D.**, Developmental-Clinical Psychology, Graduated 2007

Current Position: Assistant Professor, Pediatrics, University of Michigan School of Medicine

**Allyson A. Gilles, Ph.D.**, Developmental-Clinical Psychology, Graduated 2008

Current Position: Seeking tenure-track assistant professor positions, interview with Alliant University, San Diego, CA

**Jonathan A. Paul**. Graduate School of Biomedical Sciences. Ph.D. expected 2010.

**Beth Matano, M.A.** Developmental-Clinical Psychology, Ph.D. expected 2011.

**Nicole Heller**. Developmental Psychology, Ph.D. expected 2012.

**Michio Fukumizu, M.D., Ph.D.** Three year visiting professorship 2004-2007.

**Timothy Falkner**. Physics. Co-mentor with Prof. Ali Abedi on EEG signal to noise research project for Master's Thesis expected graduation 2010.

**Mark Svenson**, Engineering Capstone. Co-mentor with Prof. Darrell Donahue on Actigraphic prototype and data processing methods for sleep studies.

**Amy Hoffman**, Veterinary Science, Master's Thesis expected graduation 2010.

**Deborah Morrison**, Developmental Psychology Master's Program

**Christian Richard**, research assistant (2009-10), currently has moved into Graduate School of Biomedical Sciences Ph.D. Bioinformatics track

***LEADERSHIP AND ADMINISTRATION:***

**2007 University of Maine System Trustee Professor**

**2007-present Founding organizer of the Maine Neurogenetics Consortium**

- Conference 9/14/07 Mount Desert Island Biological Laboratories, 85 conferees.
- Conference 9/17/09 University of New England, 80 conferees
- Organized disbursement of \$220,000 seed through a state-wide competition.
- Organized the Maine Chapter of the Society for Neuroscience

**2005-2006 President, University of Maine Faculty Senate**

Motions passed and endorsed by the President:

- To Adopt Policies that Enhance Work-Family Balance
- To Establish the Graduate Research and Education Database
- To Provide Funding for Additional Database Subscriptions
- To Form of a Permanent (faculty led) Library Committee
- To Review the Public Policy Graduate Program Proposal
- To Endorse the Workplace Violence Program

**Co-Chair of 2005-2006 Strategic Plan and Co-author of Graduate Education Report**

**Co-Organized the *Neuroscience Minor* for undergraduates with Profs. Rosenwasser and Dowse, University of Maine.**

Graduate Coordinator of the Developmental Program and of the Psychology Department 1999-2000; 2003-2006.

Director, Child Study Center, Pre-school and Research Center 2003-2006

Chair, Faculty Senate Constitution & Bylaws Committee 2004-2005

Chair, Faculty Senate Academic Affairs Committee 2003-2004

Executive Committee member, Faculty Senate 2003-2006

Chair, Joint Faculty Senate-Administration Committee on Faculty Workload 2003

Member, President's Task Force for Gender Equity in Administration (authored executive report)

Member, Provost's Task Force for Graduate Education 2003

Steering Committee for Neuroscience Consortium, founding member, 2004-present.

Member, President's Committee on Climate for Women in Administration 2004

Member, Task Force for Retention of Women Faculty 2005-present

Chair, President's Council for Women, Co-Chair, 2001-2002

Ad-Hoc Infants and Children At-Risk Consortium, 2000-2003

Institutional Review Board, Human Subjects, University of Maine, 1994-96

**Search Committees:**

Associate Dean for College of Liberal Arts and Sciences Search Committee

Chair of Mathematics, Foreign Languages

Director of Admissions

**Peer Committee** for Interdisciplinary Faculty Member Alan Cobo-Lewis, Ph.D.

**University Affiliated Programs Research and Curriculum Committee** 1994-present

Member, Eastern Maine Medical Center Institutional Review Board 1993-present

Member, Eastern Maine Medical Center Research Committee 2003-2005

Eastern Maine Medical Center Data Safety Monitoring Board (Chaired project review-2004)

Board Member and Policy and Planning Subcommittee of Wellspring, Inc. 2001

*RECENT INVITED COLLOQUIA (partial list)*

“Opiate addiction in pregnancy and infant brain development, “ Community Care Collaborative, Washington County, Maine.

“Mechanism of CNS arousal deficits and SIDS risk” Pediatric Grand Rounds, Eastern Maine Medical Center (EMMC), Bangor, ME.

“Sleep regulation in infancy: Lessons from two cultures” Bowdoin College, Bowdoin ME.

“An experimental dyad study of child anxiety disorder and parent-child interactions during mild stress” Psychiatry Grand Rounds, Maine Medical Center, Portland, Maine.

“Pediatric sleep and its disorders: New research and intervention strategies.” Transdisciplinary Research Corporation.

"Effects of theophylline/caffeine for apnea treatment in premature infants: Implications for pediatrics." Pediatric Grand Rounds, EMMC, Bangor, ME.

"Effects of alcohol exposure on prenatal development." Multidisciplinary Psychiatric Grand Rounds, Acadia Hospital, Bangor, ME.

"Organization of arousal systems in premature infants: How sleep and movement can be used to assess CNS maturation and integrity." University of Maine, Department of Communication Sciences & Disorders.

"Spontaneous movements in preterm infants: Relationship to arousal states." University of Florence, Florence, Italy.

"Movements and state development: Behavior and CNS integrity in premature infants." University of Florence, Florence, Italy.

"Adenosine blockade by xanthines disrupts spontaneous movements and sleep." University of Pisa Neurological Institute, Pisa, Italy.

"Differences between theophylline and caffeine on states of arousal and motor activity in the premature infant at the Neonatal Intensive Care Unit." Eastern Maine Medical Center.

"Environmental influences on substance use in pregnant women." Family Practice, Residency Program, Eastern Maine Medical Center.

"Biomedical research concerning prenatal exposure to substances of abuse." Fiftieth EMMC Bioethics Grand Rounds, Eastern Maine Medical Center, Bangor, ME.

"Qualitative and quantitative aspects of spontaneous movements in healthy preterm infants." Department of Psychology, University of Maine.

"Spontaneous motility during sleep in children with and without mild sleep disturbance: Use of a therapeutic mattress." Bingham Consortium Perinatal and Child Health Study Group, Augusta, ME.

"Ontogeny of sleep patterning in normal infants and children." Downeast Health Services, Ellsworth, ME.

"Psychobiology of human maternity." Women in the Curriculum Colloquia Series, University of Maine.

"Development of the nervous system." Biopsychology-Behavioral Neuroscience Proseminar, University of Pennsylvania, Philadelphia, PA.

"Evidence for pheromonal influences governing social interactions in the developing gerbil." Departments of Psychology and Psychiatry, Harvard University, Boston Children's Hospital.

"Strategies in the study of behavioral development," Boston Behavior Study Group.

***EXTRAMURAL MEDIA DISSEMINATION (partial list)***

***UMaine Today Spring, 2010,***

<http://umainetoday.umaine.edu/past-issues/spring-2010/broken-sleep/>

***Dallas Morning News*** interview for article on infant yawning and state transitions, also picked up by the ***Associated Press***:

<http://www.dallasnews.com/sharedcontent/dallas/healthscience/stories/092903dnlivvyawning.752ca.html>

<http://www.twincities.com/mld/pioneerpress/2003/10/19/living/7032006.htm>

<http://www.mtstandard.com/articles/2003/10/07/featureshealthfitness/hjjgijicjbihiig.txt>

[http://www.hollandsentinel.com/stories/100703/lif\\_100703037.shtml](http://www.hollandsentinel.com/stories/100703/lif_100703037.shtml)

<http://www.jewishworldreview.com/1003/yawning.asp>

<http://www.macon.com/mld/macon/news/nation/6944786.htm>

**WebMD** interview for recent article on postpartum depression:

[http://my.webmd.com/content/article/29/1728\\_64202.htm?lastselectedguid={5FE84E90-BC77-4056-A91C-9531713CA348}](http://my.webmd.com/content/article/29/1728_64202.htm?lastselectedguid={5FE84E90-BC77-4056-A91C-9531713CA348})

Interviewed for article on *Pediatrics* study of infant sleep and chronic nighttime crying covered in **Medical News Today** and **Boston Globe**:

<http://www.medicalnewstoday.com/medicalnews.php?newsid=22070>

[http://www.boston.com/ae/theater\\_arts/articles/2005/05/16/study\\_babies\\_need\\_consistent\\_bedtime\\_routine/](http://www.boston.com/ae/theater_arts/articles/2005/05/16/study_babies_need_consistent_bedtime_routine/)

<http://www.news-medical.net/?id=8885>

Social anxiety in children and parents study currently submitted to *Development and Psychopathology* covered in **Portland Press Herald**

<http://pressherald.maintoday.com/news/state/050627shyness.shtml>

<http://www.umainetoday.umaine.edu/Issues/v5i3/insights.html>

*Neurogenetics Consortium*

<http://bangordailynews.com/news/t/news.aspx?articleid=150839&zoneid=500>