Curriculum Vitae

Pamela M. Greenwood

Associate Professor
Psychology Department
The Arch Lab
George Mason University
MSN 3F5, 4400 University Drive
Fairfax, VA 22030-4444
email: pgreenw1@gmu.edu

Education	Degree	Year Conferred	Field of Study
University of Illinois	B.S.	1969	Psychology
State University of New York at Stony Brook	Ph.D.	1977	Physiol. Psychology
Postdoctoral training, Yale University Department of Neurology			Electrophysiology

Professional Experience

1976 -1978: Postdoctoral Associate (faculty) in Neurology Department, Yale University School of Medicine, New Haven, CT

1978-1981: Research and Development Associate, Neuropsychology Laboratory, V.A. Medical Center, West Haven, CT

1981-1982: Postdoctoral Fellow, Burke Rehabilitation Hospital and Cornell Medical College, White Plains, NY

1986-1995: Research Associate, Cognitive Science Laboratory, Catholic University of America, Washington, DC

1995-2002: Research Associate Professor, Psychology Department, Catholic University of America, Washington, DC.

2002 to 2004: Research Professor, Psychology Department, Catholic University of America, Washington, DC

2000 to 2004: Associate Director, Cognitive Science Laboratory, Catholic University of America, Washington, DC

2004 (fall) to present: Associate Professor, The Arch Lab, Psychology Department, George Mason University, Fairfax, VA
2010-present: Associate Director, Center of Excellence in Neuroergonomics, Technology, and Cognition (CENTEC), George Mason University

Professional Activities

1978-1981:	Medical Research Service Career Development Award V.A. Research and Development Award
1985 to present:	reviewer for *PLoS ONE, Cerebral Cortex, Brain, Neurobiology of Aging, Journal of Neuroscience, Neuropsychology, Neuropsychologia, Psychology & Aging, Psychopharmacology, Attention, Perception, & Psychophysics, Journal of International Neuropsychological Society, Neuroimage, Journal of Cognitive Neuroscience*
1998 to 2005:	Reviewer for Alzheimer Disease Research Centers study section, NIH and Reviewer for BBBP-3 study section, and BBBP-5 study section, NIH, Reviewer for SBIR study section. Reviewer for Alzheimer's Association.
12/2005 & 5/2006:	Advisory Review Panel, Cognitive Neuroscience Program, NSF
2006:	University-Based Retirement Community Working Group, George Mason University.
2008:	Reviewer for NIH Special Emphasis Panel, ZRG1 BBBP-J/F12A "Risk, Dementia, and Aging."
2009-2011:	Reviewer for NIH, NIA Special Emphasis Panel, BBBP-J/F12A, Reviewer for NIH, NIDDK Special Emphasis Panel, IRG/SRG: ZDK1 SRC (99), Reviewer for NSF, Cognitive Neuroscience Program. NeuroImage editorial board

Funding

Research Projects

"Spatially-cued visual processing over the adult lifespan"
Principal Investigator: P.M. Greenwood
Agency: NIA
Type: R01 (AG12387, years 1 to 5) Period: July 1, 1994 to December 31, 2000.

Predoctoral Fellowship Program
Co-Principal Investigator: P.M. Greenwood, Principal Investigator: Camilla Chavez
Agency: NIA
Type: F31, Period 9/1/2001 – 6/30/2004.

"Visual attention/perception and APOE risk for AD"
Principal Investigator: Gene Alexander, Co-investigator, P.M. Greenwood
Agency: NIMH
Type: R03 (MH63416) Period: 9/1/01-8/31/04.

"Apolipoprotein, cognition, and Alzheimer's Disease"
Principal Investigator: Raja Parasuraman, Co-investigator, P.M. Greenwood
Agency: NIA
Type: R01 Period: 9/1/01-8/31/06.

"Use of allelic association to study the genetics of cognitive aging"
Principal Investigator: P.M. Greenwood
Agency: Virginia Center on Aging. Alzheimer's and Related Diseases Research Award Fund
Period: 7/1/05 – 6/31/06

"Apolipoprotein, cognition, and Alzheimer's Disease" competing continuation
Principal Investigator: Raja Parasuraman, Co-investigator, P.M. Greenwood
Agency: NIA
Period: 9/07 to 8/12

"Detection of ApoE-related White Matter Degeneration using Tissue Specific MRI: Sensitivity and Implications for Cognitive Function"
Principal Investigator: Vasiliki Ikonomidou, Co-PI, P.M. Greenwood
Agency: Virginia Center on Aging. Alzheimer's and Related Diseases Research Award Fund
Period: 7/1/10 – 6/31/11

"Can cognitive training heighten integrity of mind and brain in MCI and healthy old age?"
Principal Investigator: P.M. Greenwood, Co-investigators James Bicksel, James Thompson, Matt Peterson, Raja Parasuraman.
Agency: Mason-Inova Life Sciences Research Collaboration Fund
Period: 9/1/10 to 8/31/12

"The Impact of Auditory Perception Training on Brain Activation and Connectivity in Attention Networks, Reasoning Ability, and Everyday Cognitive Function in Patients with Mild Cognitive Impairment"
Principal Investigator: Maren Strenziok, Co-investigators P. Greenwood, James Bicksel, James Thompson, Raja Parasuraman
Agency: Virgina Commonwealth University
Period: 07/01/2013 – 06/30/2014

Center of Excellence in Neuroergonomics, Technology, and Cognition (CENTEC), Air Force Office of Scientific Research grant FA9550-10-1-0385
Principal Investigator: Raja Parasuraman, Co-I: Pamela Greenwood

Publications

Papers

McGarry, W., Fu, S., Parasuraman, R., Greenwood, P.M. (under review) Neural bases of surround suppression in visual search.

Greenwood, P.M. & Parasuraman, R. (under review) The mechanisms of far transfer from cognitive training: Review and Hypothesis.

Rovira, E., Mackie, R.S., Clark, N., Squire, P.N., Pulido, A. Hendricks, M., & Greenwood, P.M. (under review) A Role for Attention During Wilderness Navigation: Comparing Effects of Variation in BDNF and CHRNA4 Genes.

Monge, Z., Strenziok, M., Greenwood, P.M., Parasuraman, R. (under review) Individual differences in reasoning and visuospatial attention are associated with prefrontal and parietal white matter tracts in aging.

Leckie, R. L., Oberlin, L. E., Voss, M. W., Prakash, R. S., Szabo-Reed, A., Chaddock-Heyman, L., Phillips, S., Lin, M-K., Parasuraman, R., Greenwood, P.M., Erickson, K. I. (2014). BDNF mediates improvements in executive function following a 1-year exercise intervention. *Front Hum Neurosci, 8*, 985. doi: 10.3389/fnhum.2014.00985

Parasuraman, R. Greenwood, P., Scheldrup, M., Falcone, B., Kidwell, B., & McKendrick, R. (2014). Neuroergonomics of skill acquisition: Genetic and non-invasive brain stimulation studies. In T. Ahram, W. Karwowski, & T. Marek (Eds.), *Proceedings of the 5th International Conference on Applied Human Factors and Ergonomics.*

Scheldrup, M., Greenwood, P.M., McKendrick, R., Strohl, J., Bikson, M., Alam, M., McKinley, R.A., Parasuraman, R. (2014) Transcranial direct current stimulation facilitates cognitive multi-task performance differentially depending on anode location and subtask. *Frontiers in Human Neuroscience.* Sep 8;8:665. doi: 10.3389/fnhum.2014.00665. eCollection 2014.

Greenwood, P.M., Espeseth, T., Lin, M.-K., Reinvang, I.,-K., Parasuraman, R. Longitudinal change in working memory as a function of APOE genotype in midlife and old age. (2014) *Scandinavian Journal of Psychology*, 55(3):268-77. doi: 10.1111/sjop.12123.

Greenwood, P.M. , Lin, M.-K., Sundarajan, R., Fryxell, K.J., Parasuraman, R. (2014) Healthy aging increases the cognitive effects of two genes that influence extracellular dopamine. *Psychology and Aging*, 29(2):363-73. doi: 10.1037/a0036109.

Parasuraman, R., Kidwell, B., Olmstead, R., Lin, M.-K., Jankord, R., Greenwood, P.M. (2013). Interactive Effects of the COMT Gene and Training on Individual differences in supervisory control of unmanned vehicles. *Human Factor*s, June;56(4):760-71. DOI: 10.1177/0018720813510736

Strenziok, M., Parasuraman, R., Clarke, E., Cisler, D.S., Thompson J.C., Greenwood P.M. (2014). Neurocognitive enhancement in older adults: Comparison of three cognitive training tasks to test a hypothesis of training transfer in brain connectivity, *Neuroimage* Jan 15;85 Pt 3:1027-39; DOI: 10.1016/j.neuroimage.2013.07.069.

Strenziok, M., Greenwood, P. M., Thompson, J.C., Parasuraman, R. (2013) Differential contributions of dorso-ventral and rostro-caudal prefrontal white matter tracts to cognitive control in healthy older adults. *PLoS ONE* 8(12):e81410. doi: 10.1371

Wang, Y., Fu, S., Greenwood, P., Luo, Y., & Parasuraman, R. (2012). Perceptual load, voluntary attention, and aging: an event related potential study. *International Journal of Psychophysiology, 84*, 17-25.

Greenwood, P. M., Parasuraman, R., & Espeseth, T. (2012). A cognitive phenotype for the nicotinic receptor gene CHRNA4 rs1044396. Neuroscience and Biobehavioral Reviews, 36, 1331-1341.

Parasuraman, R., de Visser, E., Lin, M-K., & Greenwood, P.M. (2012) Dopamine Beta Hydroxylase genotype identifies individuals less susceptible to bias in computer-assisted decision making. PLoS ONE, 7, e39675.

Greenwood, P.M. & Parasuraman, R. (2010) Neuronal and cognitive plasticity: a neurocognitive framework for ameliorating cognitive aging. Invited paper for Special Topic Issue: Interventions for aging brains and minds. Frontiers in Aging Neuroscience, 150, 1-13.

Lin, M-K, Greenwood, P. M., & Parasuraman, R. Fryxell, K.J. (submitted) Modulation of Human Spatial Working Memory by Interactions between Age and the CHRM2 A1890T SNP.

Lin, M-K, Greenwood, P. M., & Parasuraman, R. Sundararajan, R., Fryxell, K.J. (submitted). Age and gender-related effects of COMT val158met on working memory.

Clarke, E., Fu, S., Espeseth, T., Parasuraman, R., Greenwood, P.M. Attentional modulation of delay period activity during working memory retention (under review).

Fu, S. Fedota, J., Greenwood, P. M., & Parasuraman, R. (2010 Dissociation of visual C1 and P1 components as a function of attentional load: An event-related potential study. *Biological Psychology*

Fu, S., Fedota, J., Greenwood, P. M., & Parasuraman, R. (2010). Early interaction between perceptual load and involuntary attention: An event-related potential study. *Neurosci Lett*. 468(1):68-71.

Fu, S., Huang, Y., Luo, Y., Wang, Y., Fedota, J., Greenwood, P. M., et al. (2009). Perceptual load interacts with involuntary attention at early processing stages: Event-related potential studies. *Neuroimage*. *48*(1), 191-199.

Greenwood, P. M., Lin, M. K., Sundararajan, R., Fryxell, K. J., & Parasuraman, R. (2009). Synergistic effects of genetic variation in nicotinic and muscarinic receptors on visual attention but not working memory. *Proc Natl Acad Sci U S A, 106*(9), 3633-3638.

Greenwood, P. M., Sundararajan, R., Lin, M. K., Kumar, R., Fryxell, K. J., & Parasuraman, R. (2009). Both a Nicotinic SNP and a Noradrenergic SNP Modulate Working Memory Performance when Attention is Manipulated. *J Cogn Neurosci*. 21 (11) 2139-53.

Greenwood, P.M. (2007) Functional plasticity in cognitive aging: Review and hypothesis. *Neuropsychology, 21,* 657-673. *(*Published with open peer commentary)

Greenwood, P.M. (2007) Reply to Grady, Raz, and Salthouse: Can age and treachery overcome youth and skill? *Neuropsychology 21,* 680-683. *(*Response to open peer commentary)

Negash, S., Greenwood, P.M., Sunderland, T., Parasuraman, R., Geda, Y.E., Knopman, D.S., Boeve, B.F., Ivnik, R., Petersen, R.J., Smith, G.E. (2009) The influence of apolipoprotein E genotype on visuospatial attention dissipates after age 80. *Neuropsychology, 23*, 81-89.

Caggiano, D.M., Greenwood, P.M., Knott, C.C., Parasuraman, R. (under review) Age-related Changes in Attentional Scaling: An Eye Movement Analysis. Under review

Espeseth, T., Greenwood, P. M., Reinvang, I., Fjell, A. M., Walhovd, K. B., Westlye, L. T., Parasuraman, R. (2006). Interactive effects of APOE and CHRNA4 on attention and white matter volume in healthy middle-aged and older adults. *Cognitive, affective, and behavioral neuroscience, 6*, 31-43.

Greenwood, P. M., Sunderland, T., Putnam, K., Levy, J. A., & Parasuraman, R. (2005). Scaling of visuospatial attention undergoes differential longitudinal change as a function of APOE genotype prior to old age: Results from the NIMH BIOCARD study. *Neuropsychology, 19,* 830-840.

Greenwood, P.M., Fossella, J.A., Parasuraman, R. (2005) Specificity of the effect of a nicotinic receptor polymorphism on individual differences in visuospatial attention. *Journal of Cognitive Neuroscience, 17*: 1611-1620.

Greenwood, P. M., Lambert, J. C., Sunderland, T., & Parasuraman, R. (2005). Effects of APOE genotype on spatial attention, working memory, and their interaction in healthy, middle-aged adults: Results from the NIMH's BIOCARD study. *Neuropsychology*, *19*, 199-211.

Fu, S., Greenwood, P.M., Parasuraman, R. (2005) Brain mechanisms of involuntary

visuospatial attention: An event-related potential study. *Human Brain Mapping, 25,* 378-390.

Parasuraman, R., Greenwood, P., Kumar, R., & Fossella, J. (2005). Beyond heritability: Neurotransmitter genes differentially modulate visuospatial attention and working memory. *Psychological Science, 16*(3).200-207.

Fu, S., Caggiano, D., Greenwood, P.M., & Parasuraman, R. (2005) Event-related potentials reveal dissociable mechanisms for orienting and focusing visuospatial attention. *Cognitive Brain Research*, *23*, 341-353.

Greenwood, P.M. & Parasuraman, R. (2004) Age-related changes in the time course of attentional scaling during visual search. *Perception & Psychophysics,* 66, 3-22.

Greenwood, P., & Parasuraman, R. (2003). Normal genetic variation, cognition, and aging. *Behavioral and Cognitive Neuroscience Reviews, 2, 278-306.*

Parasuraman, R. & Greenwood, P. & Alexander, G.E. (Under review) Attention shifting deficit in a visual discrimination task increases with progression of early Alzheimer's Disease.

Parasuraman, R. & Greenwood, P. & Sunderland, T. (2002) The apolipoprotein E gene, attention, and brain function. *Neuropsychology*, 16, 254-274

Luo, Y.-J., Greenwood, P.M., Parasuraman, R. (2001) Dynamics of the spatial scale of visual attention revealed by brain event-related potentials. *Cognitive Brain Research, 12,* 371-381.

Greenwood, P.M., Sunderland, T. Friz, J., Parasuraman, R. (2000) Genetics and visual attention: Selective deficits in healthy adult carriers of the e4 allele of the apolipoprotein E gene. *Proceedings of the National Academy of Sciences,* 97, 11661-11666.

Greenwood, P.M. (2000) Reply to West. *Journal of the International Neuropsychological Society*, 6, 730.

Greenwood, P.M. (2000) The frontal aging hypothesis evaluated. *Journal of the International Neuropsychological Society*, 6, 730.

Parasuraman, R., Greenwood, P.M. & Alexander, G.E. (2000) Alzheimer disease constricts the dynamic range of spatial attention in visual search. *Neuropsychologia*, 38, 1026-1135

Levy, J.A., Parasuraman, R., Greenwood, P.M., Dukoff, R. Sunderland, T. (2000) Acetylcholine affects the spatial scale of attention: Evidence from Alzheimer's Disease. *Neuropsychology,* 14, 288-298.

Jiang, Y., Greenwood, P.M. & Parasuraman, R. (1999) Age-related reduction in 3-D visual motion priming. *Psychology and Aging, 14,* 619-626.

Greenwood, P.M. & Parasuraman, R. (1999) Scale of attentional focus in visual search: Effects of adult aging. *Perception and Psychophysics. 61*, 837-859.

Greenwood, P.M., Parasuraman, R. & Alexander, G.E. (1997) Controlling the focus of spatial attention during visual search: Effects of advanced aging and Alzheimer Disease. *Neuropsychology*, *11*, 3-12.

Parasuraman, R., Greenwood, P.M. & Alexander, G.E. (1995) Selective impairment of spatial attention during visual search in Alzheimer's Disease. *Neuroreport*, *6*, 1861-1864.

Greenwood, P.M. & Parasuraman, R. (1994) Attentional disengagement deficit in nondemented elderly over 75 years of age. *Aging and Cognition, 1*, 188-202.

Greenwood, P.M., Parasuraman, R., & Haxby, J.V. (1993) Directed visual attention over the adult life span. *Neuropsychologia, 31,* 471-485.

Parasuraman, R., Greenwood, P.M., Haxby, J.V. & Grady, C.L. (1992) Visuospatial attention in dementia of the Alzheimer type. *Brain*, *115*, 711-733.

Greenwood, P. & Parasuraman, R. (1991) Effects of aging on the speed of attentional cost of cognitive operations. *Developmental Neuropsychology*, *7*, 421-434.

Parasuraman, R., Nestor, P. and Greenwood, P.M. (1989) Sustained-attention capacity in young and old adults. *Psychology and Aging*, *4*, 339-345.

Greenwood, P.M. & Goff, W.R. (1987) Modification of median nerve somatic evoked potentials by prior median nerve, peroneal nerve and auditory stimulation. *Electroencephalography and Clinical Neurophysiology,* 68, 295-302.

Greenwood, P.M., Rotkin, L.G., Wilson,D.H. & Gazzaniga, M.S. (1980) Psychophysics with the split-brain subject: On hemispheric differences and numerical mediation in perceptual matching tasks. *Neuropsychologia*, 18, 419-434.

Greenwood, P.M., Wilson, D.H.,& Gazzaniga, M.S. (1977) Dream report following commissurotomy. *Cortex*, 13, 311-316.

Greenwood, P.M. & Singer, J.J. (1974) Cortical spreading depression induced state dependency. *Behavioral Biology,* 10, 345-351.

Chapters and Books

Greenwood, P.M. & Gazzaniga, M.S. (1985). Human brain injury and recovery: Psychometric clues to mechanism. In A. Bignami, F.E. Bloom, C.L.Bolis & A.Adeloye (Eds.) *Central Nervous Plasticity and Repair.* Raven Press, New York.

Parasuraman, R. & Greenwood, P.M. (1996). Functional brain imaging and selective attention in early Alzheimer's disease. In B. Vellas, L.J. Fitten, B. Dubois, J.L Alborede (Eds.) *Facts and Research in Gerontology*. Springer, NewYork

Greenwood, P.M. & Parasuraman, R. (1997). Attention in aging and Alzheimer's Disease: Behavior and neural systems. In J. Burack and J. Enns, *Attention, development and Psychophysiology*, Guilford Press, NY.

Parasuraman, R. & Greenwood, P.M. (1997). Attention and brain function in aging and Alzheimer's disease. In I.L Singh & R. Parasuraman (Eds.) *Recent Advances in Cognition: A Multidisciplinary Perspective*. New Delhi: Sage.

Parasuraman, R. & Greenwood, P.M. (1998). Selective attention in aging and dementia. In R. Parasuraman (Ed.) *The Attentive Brain.* MIT Press, Cambridge.

Parasuraman, R. & Greenwood, P.M. (2006) Individual differences in attention and working memory: A molecular genetics approach. In A. Kramer, D. Wiegemann, & A. Kirlik (Eds.) *Attention: From Theory to Practice*. New York: Oxford University Press.

Greenwood, P.M. & Parasuraman, R. (2012) Nurturing the Older Brain and Mind. MIT Press.

Papers Presented

Rotkin, L.G., Greenwood, P.M., Gazzaniga, M.S. (1977) Psychophysics with "split-brain" patient. Perceptual asymmetries and verbal mediation in sensory judgments. Eastern Psychological Association.

Fischer, M.A. & Greenwood, P.M. (1978) Visual field effects in the mental rotation of two-dimensional figures. Annual Meeting of the International Neuropsychological Society.

Greenwood, P.M. & Goff, W.R. (1981) Interictal recovery functions of the somatosensory evoked potential in epileptics. *Electroencephalography and Clinical Neurophysiology*, 51, 22p.

Greenwood, P.M. & Tweedy, J.R. (1983) Effects of diffuse brain injury on network representations of semantic similarity. International Neuropsychological Society.

Reding, M., Luby, R., Wagner, M. and Greenwood, P. (1984) The P300 response to a written oddball stimulus-recognition task allows for sensitive, objective serial measurements of language dysfunction. American Foundation for Clinical Research.

Greenwood, P.M., Parasuraman, R., & Haxby, J. (1989, October) Covert attentional shifts and cerebral metabolism in Alzheimer's disease and normal aging. Society for Neuroscience, Phoenix, Az.

Greenwood, P.M., Parasuraman, R. & Haxby, J. (1991, February) Shifts of visual attention in mild and moderate Alzheimer's disease. Presented at the International Neuropsychological Society.

Greenwood, P.M., Parasuraman, R. and May, P. (1992, April). Visuospatial attention is altered in 75-85 year olds. Cognitive Aging Society Conference, Atlanta, Georgia.

Greenwood, P.M., Parasuraman, R., Panicker, S. & Haxby, J.V. (1992, October). Effects of size of attentional focus on visual search in aged adults. Society for Neuroscience Annual Meeting, Anaheim, CA.

Berardi, A., Gaillard, F., Haxby, J.V., Greenwood, P.M. and Parasuraman, R. (1992, November). Age-related differences in sustained attention for a high event-rate visual digit discrimination task. American Geriatrics Society Annual Conference, Washington, D.C..

Panicker, S., Greenwood, P.M., Parasuraman, R. and Haxby, J.V. (1993, November). Cued visual search in Alzheimer's disease. Presented at the Society for Neuroscience Annual Meeting, Washington, D.C.

Panicker, S., Greenwood, P.M. and Parasuraman, R. (1994, November). Effects of age on the distribution of visuospatial attention. Presented at the Society for Neuroscience Annual Meeting, Miami, FL.

Hardy, D.L., Greenwood, P.M., Parasuraman, R. (1995, June) Effect of distractors on visuospatial attention processes in normal elderly. Presented at the Annual Meeting of the American Psychological Society, NYC.

Greenwood, P.M., Parasuraman, R. & Alexander, G.E. (1995, November) Effects of normal aging on the spatial distribution of visuospatial attention in visual search. Presented at the Society for Neuroscience Annual Meeting, San Diego, CA.

Johnson, S.R., Greenwood, P.M., Hicks, L. & Parasuraman, R. (1996, April) Age effects on intermodal spatial attention. Presented at the Cognitive Aging Conference, Atlanta, Georgia.

Greenwood, P.M. & Parasuraman, R. (1996, April). Control of the focus of visuospatial attention in healthy aging. Presented at the Cognitive Aging Conference, Atlanta, Georgia.

Greenwood, P.M. & Parasuraman, R. (1996, November). Healthy aging slows dynamic adjustment of the scale of the attentional focus. Presented at the Society for Neuroscience Annual Meeting, Washington, DC.

Jiang, Y., Greenwood, P., Parasuraman, R. (1997, April) Temporal dynamics of 3-D motion priming in young and older adults. Presented at the Cognitive Neuroscience Society, San Francisco.

Greenwood, P.M., Parasuraman, R. & Alexander, G.E. (1997). Changes in the ability to dynamically adjust the attentional focus from youth to old age to Alzheimer Disease. Presented at the Society for Neuroscience Annual Meeting, New Orleans, LA.

Levy, J. , Parasuraman, R., Greenwood, P., Dukoff, R., Lasser, R. & Sunderland, T. (1998, February). Acetylcholine affects the spatial distribution of attention: Evidence from Alzheimer's Disease. Presented at the International Neuropsychological Society,

Greenwood, P.M., Parasuraman, R. (1998) Aging delays the development but increases the magnitude of effects of precue precision in visual search. Presented at the Cognitive Aging Conference, Atlanta, Georgia.

Alexander, G.E., Greenwood, P.M., Szczepanik, J., Levine, B. Pietrini, P., et al. (1998) Functional brain response in right prefrontal cortex with increasing distraction during visual selective attention. Paper presented at the International Conference on Functional Mapping of the Human Brain, June, Montreal.

Greenwood, P.M. Alexander, G.E., Parasuraman, R. (1998) Visual search in healthy aging and Alzheimer Disease. Paper presented at the Society for Neuroscience, November, Los Angeles.

Chavez, C.M., Greenwood, P.M. & Parasuraman, R. (1998) Benefits of location cue validity for luminance detection increase over the adult lifespan. Paper presented at the Society for Neuroscience, November, Los Angeles.

Greenwood, P.M., Parasuraman, R. & Sunderland, T. The ability to shift and to scale visuospatial attention is impaired in aging, but only in the presence of the apoE e4 allele. Paper presented at the Cognitive Neuroscience Society, April, 1999.

Luo, Y., Greenwood, P.M., & Parasuraman, R. Electrophsiological correlates of the scaling of the focus of visuospatial attention. Paper presented at the Society for Neuroscience, November, 1999.

Greenwood, P.M., Alexander, G.E., & Parasuraman, R. Progression in early Alzheimer disease increases costs but not benefits of cue validity in visuospatial attention. Paper presented at the Society for Neuroscience, November, 1999.

Chavez, C., Greenwood, P.M., & Parasuraman, R. Visual search accuracy benefits from a larger attentional focus in young and old. Paper presented at the Society for Neuroscience, November, 2000.

Greenwood, P.M., Caggiano, D., & Parasuraman, R. The fastest search is not accompanied by the fewest fixations of the eyes in young or old. Paper presented at Cognitive Neuroscience Society, March, 2001.

Greenwood, P.M., R., Friz, J. Lambert, C. & Sunderland, R Parasuraman. Focussing attention at the boundary of healthy and pathologic aging. Paper presented at the Cognitive Neuroscience Society, San Francisco, CA, April 2002.

Greenwood, P.M., Sunderland, T., Friz, J., Lambert, C. & Parasuraman, R. Memory, attention, and attention to memory: Is a cognitive 'phenotype' of apoE e4 detectable

in healthy middle-age? Paper presented at the Society for Neuroscience, November, 2002.

Greenwood, P.M., Fossella, J., Parasuraman, R. Double dissociation of modulation of visuospatial attention and working memory by normal allelic variation in cholinergic and dopaminergic genes. Paper presented at the Cognitive Neuroscience Society, San Francisco, CA, April 2003.

Kumar, R., Greenwood, P.M., Parasuraman, R. How Is Visuospatial Attention Distributed? Effects Of Age And Precue Precision On Its Distribution. Paper to be presented at the Society for Neuroscience, November, 2003.

Chavez Knott, C., Greenwood, P.M., Parasuraman, R. Aging Decreases Efficient Saccade Execution In Visual Search. Paper presented at the Society for Neuroscience, November, 2003.

Fu, S., Greenwood, P.M., Vo, H.T., Parasuraman, R. Early direct modulation or late feedback in striate cortex: An event-related potential localization study of visual selective attention. Paper presented at the Society for Neuroscience, November, 2003.

Greenwood, P.M., Fossella, J.F. & Parasuraman, R. (2003) Double dissociation of modulation of visuospatial attention and working memory by normal allelic variation in cholinergic and dopaminergic genes. Presentation at the Cognitive Neuroscience Society, April, New York.

Greenwood, P.M., Lambert, C., Putnam, K., Sunderland, T., Levy, J. & Parasuraman, R. (2004). Scaling of visuospatial attention undergoes differential longitudinal change as a function of APOE genotype prior to old age: Results from the NIMH BIOCARD study. Presentation to the Cognitive Neuroscience Society, April, San Francisco

Fu, S., Huang, X., Luo, Y-J, Greenwood, P.M. and Parasuraman, R. (2004) The role of perceptual difficulty in visuospatial attention: an event-related potential study. Presentation to the Cognitive Neuroscience Society, April, San Francisco.

Knott, C.C., Lambert, C., Kumar, R. & Greenwood, P.M. (2004) Probing the gradient of attention. Presentation to the Cognitive Neuroscience Society, April, San Francisco.

Keech, T., Greenwood, P.M., Resca, L. & Parasuraman, R. (2004) Dynamics of spontaneous saccades in conjunctive visual search. Paper presented at the Society for Neuroscience, October, San Diego.

Knott, C.C., Greenwood-Ericksen, A., Greenwood. P.M. (2004) The Spatial Distribution Of Visuospatial Attention Is Altered In Aging. Paper presented at the Society for Neuroscience, October, San Diego.

Greenwood, P.M., Fossella, J. & Parasuraman, R. Normal variation in a nicotinic receptor gene (CHRNA4) modulates deployment of visuospatial attention. (2004) Paper presented at the Society for Neuroscience, October, San Diego.

Fu, S., Wang, Y., Luo, Y., Greenwood, P.M., Parasuraman, R. (2004) The role of perceptual difficulty in visuospatial attention: an event-related potential study. Paper presented at the Society for Neuroscience, October, San Diego.

Greenwood, P.M., Sunderland, T., Parasuraman, R. (2005) APOE genotype alters the effect of attention on memory but in a manner distinguishable from healthy aging. Paper presented at the Cognitive Neuroscience Society, April, New York.

Kumar, R., Greenwood, P.M., Parasuraman, R. (2005) Effects of age on the distribution of visuospatial attention across cue boundaries. Paper presented at the Cognitive Neuroscience Society, April, New York.

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Greenwood, P. M. Kumar, R., Sundararajan, R., Fryxell, K. J., Lin, M.-K., Parasuraman, R. Effects of attention on working memory are modulated by a nicotinic SNP (CHRNA4) but not a noradrenergic SNP (DBH). Presented at Society for Neuroscience, October, 2006.

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Squire, PN., Greenwood, PM., Parasuraman, P., (2008) Covert Spatial Attention: Single or Separate Mechanisms? Quantitative Training for Underrepresented Groups, Boston, MA

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Squire, P. N., Greenwood, PM., Parasuraman, P., (2009) Is Visuospatial Attention Governed By A Unified Process Or Separate Processes? Human Factors and Ergonomics Society Meeting, San Antonio, TX

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Strenziok, M. Greenwood, P.M., McGarry, W.R.,Thompson, J.C., Parasuraman, R. White matter integrity in the left anterior PFC and right posterior frontal and parietal cortices facilitates cued spatial working memory performance. To be presented at Society for Neuroscience 40th Annual Meeting. Nov. 2011.

Lin, M., Greenwood, P.M., McGarry, W.R., Fryxell, K.J., Thompson, J.C., Parasuraman, R. Effects of COMT haplotype on cortical thickness and surface area in human brain. To be presented at Society for Neuroscience 40th Annual Meeting. Nov. 2011.

Clarke, E. McGarry, W.R., Bicksel, J., Thompson, J., Peterson, M.S., Strohl, J., Greenwood, P.M., arasuraman, R. Cognitive training in healthy old age: Comparison of 3 training tasks on everyday cognitive functioning and white matter integrity. Presented at Society for Neuroscience 40th Annual Meeting. Nov. 2011.

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Greenwood, P. M., Strenziok, M., Clarke, E., McGarry, W. R., Bicksel, J., Thompson, J.C., & Parasuraman, R. Cerebral White Matter Integrity and Everyday
Problem Solving Changes after Cognitive Training with Video Games in Healthy Old Age. Paper presented at the Annual Meeting of the Cognitive Neuroscience Society, Chicago, IL, March 2012.

Strohl, J., Greenwood, P. M., Lindgren, E., & Parasuraman, R. Differential effects of transcranial direct current stimulation of prefrontal and motor cortex on a complex cognitive task. Paper to be presented at the Society for Neuroscience, New Orleans, LA. November, 2012.

Monge, Z.*, Strenziok, M.*, Greenwood, P.M., Parasuraman,R. Individual Differences in Reasoning and Visuospatial Attention are associated with Prefrontal and Parietal White Matter Tracts. Eastern Psychological Association, NYC, NY, April, 2013.

Melissa Scheldrup[1], Jon Strohl[1], Jessica Vance[1], Danielle Walker[1], Pamela Greenwood[1], Raja Parasuraman[1];[1] George Mason University. Transcranial direct current stimulation exerts selective benefits on executive control in a complex task whether prefrontal or motor cortex is stimulated. Cognitive Neuroscience Society 2013 Meeting, April 13-16, 2013, San Francisco, CA.

McGarry, R., Strenziok, M., Cisler, D.S., Clarke, E., Santa Cruz, S.A., Thompson, J.C., Parasuraman, R., & Greenwood, P.M. Real-Time Strategy Video Game Training Increases Fronto-Parietal Cortical Thickness, Default Mode Network Connectivity, and Reasoning Ability in Healthy Older Adults. Cognitive Neuroscience Society 2013 Meeting, April 13-16, 2013, San Francisco, CA.

Parasuraman, R. & Greenwood, P.M. Video Game Training and Transcranial Direct Current Brain Stimulation Enhance Human Learning and Brain Function. Symposium presented at APA Convention, Honolulu, 7/31-8/4, 2013.

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Cisler, D., Strenziok, M., Parasuraman, R. Greenwood, P.M. Intensive working memory training transfers to everyday functioning and alters connectivity between the dorsal and ventral attention networks**.** Presented to Society for Neuroscience, Washington, D.C., 2014

Scheldrup, M.R., Vance, J., McKinley, R., Bikson, M., Parasuraman, R., Greenwood, P.M. Transcranial Direct Current Stimulation differentially influences implicit and explicit memory in a multi-task. Presented to Society for Neuroscience, Washington, D.C., 2014

Clayton, E., Cisler, D., McKinley, R., Bikson, M., Greenwood, P.M., Parasuraman, R. Comparison of cognitive training vs transcranial Direct Current Stimulation on performance of a "Cyber Defense" multi-task. Presented to Society for Neuroscience, Washington, D.C., 2014

Greenwood, P.M. Invited "State of the Science" talk at Cognitive Aging Conference, April 6, 2014, in Atlanta Georga. Title of talk was "Heterogeneity in cognitive aging: genetics and epigenetics."

Scheldrup, M.R., Vance, J., Blumberg, E., McKendrick, R., McKinley, R., Parasuraman, R, Greenwood, P.M. Transcranial direct current stimulation differentially affects subtasks during simulation of a real-world multi-task. To be presented at Cognitive Neuroscience Society, April, 2015.