



Universiteit  
Leiden  
The Netherlands

**Arousal, exploration and the locus coeruleus-norepinephrine system**  
Jepma, M.

**Citation**

Jepma, M. (2011, May 12). *Arousal, exploration and the locus coeruleus-norepinephrine system*. Retrieved from <https://hdl.handle.net/1887/17635>

Version: Not Applicable (or Unknown)

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/17635>

**Note:** To cite this publication please use the final published version (if applicable).

## References

- Abercrombie, E.D., & Jacobs, B.L. (1987). Single-unit response of noradrenergic neurons in the locus coeruleus of freely moving cats. II. Adaptation to chronically presented stressful stimuli. *Journal of Neuroscience*, 7, 2844-2848.
- Aghajanian, G.K., Cedarbaum, J.M., & Wang, R.Y. (1977). Evidence for norepinephrine-mediated collateral inhibition of locus coeruleus neurons. *Brain Res*, 136, 570-7.
- Alvarez, V.A., Chow, C.C., Van Bockstaele, E.J., & Williams, J.T. (2002). Frequency-dependent synchrony in locus ceruleus: role of electrotonic coupling. *Proc Natl Acad Sci USA*, 99, 4032-4036.
- Anderson, B.D.O., & Moore, J.B. (1979). Optimal Filtering. Englewood Cliffs, NJ: Prentice-Hall.
- Arango, V., Underwood, M.D., & Mann, J.J. (1996). Fewer pigmented locus coeruleus neurons in suicide victims: preliminary results. *Biol Psychiatry*, 39, 112-20.
- Ashburner, J., & Friston, K.J. (2000). Voxel-based morphometry-the methods. *Neuroimage*, 11, 805-21.
- Aston-Jones, G. (2004). Locus coeruleus, A5 and A7 noradrenergic cell groups. In G. Paxinos (Ed.), *The rat nervous system* (3rd edition, pp. 259–294). San Diego: Elsevier Academic Press.
- Aston-Jones, G., & Bloom, F.E. (1981a) Activity of norepinephrine-containing locus coeruleus neurons in behaving rats anticipates fluctuations in the sleep-waking cycle. *Journal of Neuroscience*, 1, 876-86.
- Aston-Jones, G., & Bloom, F.E. (1981b). Norepinephrine-containing locus coeruleus neurons in behaving rats exhibit pronounced responses to non-noxious environmental stimuli. *Journal of Neuroscience*, 1, 887-900.
- Aston-Jones, G., Foote, S.L., & Bloom, F.E. (1984). Anatomy and physiology of locus coeruleus neurons: functional implications. In: Ziegler, M., Lake, C.R. (eds). *Frontiers of Clinical Neuroscience*: Vol. 2, *Norepinephrine*. Williams and Wilkins: Baltimore. pp 92-116.
- Aston-Jones, G., Iba, M., Clayton, E., Rajkowski, J., & Cohen, J.D. (2007). Locus coeruleus and regulation of behavioral flexibility and attention: Clinical implications. In Ordway, G.A., Schwartz, M., & Frazer, A. (eds.), *Norepinephrine: Neurobiology and Therapeutics for the 21st Century*, (pp. 196-235). Cambridge University Press: Cambridge, UK.
- Aston-Jones, G., Rajkowski, J., Kubiak, P., Valentino, R.J., & Shipley, M.T. (1996). Role of the locus coeruleus in emotional activation. *Prog Brain Res*, 107, 379-402.
- Aston-Jones, G., & Cohen, J.D. (2005). An integrative theory of locus coeruleus-norepinephrine function: adaptive gain and optimal performance. *Annual Review of Neuroscience*, 28, 403-450.
- Aston-Jones, G., Ennis, M., Pieribone, V.A., Nickell, W.T., & Shipley, M.T. (1986). The brain nucleus locus coeruleus: restricted afferent control of a broad efferent network. *Science*, 234, 734-737.
- Aston-Jones, G., Rajkowski, J., & Cohen, J. (2000). Locus coeruleus and regulation of behavioral flexibility and attention. *Progress in Brain Research*, 126, 165-182.
- Aston-Jones, G., Rajkowski, J., & Cohen, J. (1999). Role of locus coeruleus in attention and behavioral flexibility. *Biological Psychiatry*, 46, 1309-20.

- Aston-Jones, G., Rajkowsky, J., & Kubiak, P. (1997). Conditioned responses of monkey locus coeruleus neurons anticipate acquisition of discriminative behavior in a vigilance task. *Neuroscience*, 80, 697-715.
- Aston-Jones, G., Rajkowsky, J., Lu, W., Zhu, Y., Cohen, J.D., & Morecraft, R.J. (2002). Prominent projections from the orbital prefrontal cortex to the locus coeruleus in monkey. *Society for Neuroscience Abstracts*, 28, 86-89.
- Aston-Jones, G., Rajkowsky, J., Kubiak, P., Alexinsky, T. (1994). Locus coeruleus neurons in monkey are selectively activated by attended cues in a vigilance task. *Journal of Neuroscience*, 14, 4467-80.
- Baayen, R.H., Piepenbrock, R., & Gulikers, L. (1995). CELEX-2. CD-ROM available from the Linguistic Data Consortium, University of Pennsylvania.
- Bausenhart, K.M., Rolke, B., & Ulrich, R. (2008). Temporal preparation improves temporal resolution: evidence from constant foreperiods. *Perception and Psychophysics*, 70, 1504-1514.
- Bausenhart, K.M., Rolke, B., Seibold, V.C., & Ulrich, R. (2010). Temporal preparation influences the dynamics of information processing: Evidence for early onset of information accumulation. *Vision Research*, 50, 1025-34.
- Beatty, J., & Wagoner, B.L. (1978). Pupillometric signs of brain activation vary with level of cognitive processing. *Science*, 199, 1216-8.
- Beckmann, C.F., Jenkinson M., & Smith, S.M. (2003). General multilevel linear modeling for group analysis in fMRI. *Neuroimage* 20, 1052-63.
- Behrens TE, Woolrich MW, Walton ME, & Rushworth MF (2007). Learning the value of information in an uncertain world. *Nat Neurosci* 10: 1214-1221.
- Benzi, R., Sutera, A., & Vulpiani, A. (1981). The mechanism of stochastic resonance. *Journal of Physics A*, 14, L453-L457.
- Berlyne, D.E. (1954). A theory of human curiosity. *Br J Psychol*, 45, 180-91.
- Berlyne, D.E. (1960). Conflict, Arousal, and Curiosity. New York: McGraw Hill.
- Berlyne, D.E. (1966). Curiosity and exploration. *Science*, 153, 25-33.
- Berlyne, D.E., & Borsa, D.M. (1968). Uncertainty and the orientation reaction. *Percept Psychophys*, 3, 77-79.
- Berlyne, D.E., & Normore, L.F. (1972). Effects of prior uncertainty on incidental free recall. *J Exp Psychol*, 96, 43-48.
- Bernstein, I.H. (1970). Can we see and hear at the same time? Intersensory facilitation of reaction time. *Acta Psychologica*, 33, 21-35.
- Bernstein, I.H., Chu, P.K., Briggs, P., & Schurman, D.L. (1973). Stimulus intensity and foreperiod effects in intersensory facilitation. *Quarterly Journal of Experimental Psychology*, 25, 171-81.
- Bernstein, I.H., Clark, M.H., & Edelstein, B.A. (1969a). Effects of an auditory signal on visual reaction time. *Journal of Experimental Psychology*, 80, 567-569.
- Bernstein, I.H., Clark, M.H., & Edelstein, B.A. (1969b). Intermodal effects in choice reaction time. *Journal of Experimental Psychology*, 81, 405-407.
- Bernstein, I.H., Rose, R.G., & Ashe, V. (1970). Energy integration in intersensory facilitation. *Journal of Experimental Psychology*, 86, 196-203.
- Bernstein, P.S., Scheffers, M.K., & Coles, M.G. (1995). "Where did I go wrong?" A psychophysiological analysis of error detection. *Journal of Experimental Psychology. Human Perception and Performance*, 21, 1312-1322.

- Berridge, C.W., & Waterhouse, B.D. (2003). The locus coeruleus-noradrenergic system: modulation of behavioral state and state-dependent cognitive processes. *Brain Research. Brain Research Reviews*, 42, 33-84.
- Bertelson, P. (1967). The time course of preparation. *Quarterly Journal of Experimental Psychology*, 19, 272-279.
- Bertelson, P., & Tisseyre, F. (1968). The time course of preparation with regular and irregular foreperiods. *Quarterly Journal of Experimental Psychology*, 20, 297-300.
- Biaggioni, I., Goldstein, D.S., Atkinson, T., & Robertson, D. (1990). Dopamine-beta-hydroxylase deficiency in humans. *Neurology*, 40, 370-3.
- Biaggioni, I., & Robertson, D. (1987). Endogenous restoration of noradrenaline by precursor therapy in dopamine beta-hydroxylase deficiency. *Lancet*, 2, 1170-2.
- Blenner, J.L., and Yingling, C.D. (1993). Modality specificity of evoked potential augmenting/reducing. *Electroencephalography and Clinical Neurophysiology*, 88, 131-142.
- Bogacz, R., Wagenmakers, E.-J., Forstmann, B.U., & Nieuwenhuis, S. (2010). The neural basis of the speed-accuracy tradeoff. *Trends in Neurosciences*, 33, 10-16.
- Bond, A., & Lader, M. (1974). The use of analogue scales in rating subjective feelings. *Br J Psychol*, 67, 211–218.
- Boorman, E.D., Behrens, T.E., Woolrich, M.W., & Rushworth, M.F. (2009). How green is the grass on the other side? Frontopolar cortex and the evidence in favor of alternative courses of action. *Neuron*, 62, 733-743.
- Borland, R.G., & Nicholson, A.N. (1984). Visual motor co-ordination and dynamic visual acuity. *Br J Clin Pharmacol*, 18(suppl 1), 69S–72S.
- Botvinick, M.M. (2007). Conflict monitoring and decision making: reconciling two perspectives on anterior cingulate function. *Cognitive, Affective & Behavioral Neuroscience*, 7, 356-366.
- Bourdaud, N., Chavarriaga, R., Galan, F., & Millán, Jdel R. (2008). Characterizing the EEG correlates of exploratory behavior. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 16, 549-556.
- Bouret, S., & Sara, S.J. (2004). Reward expectation, orientation of attention and locus coeruleus-medial frontal cortex interplay during learning. *European Journal of Neuroscience*, 20, 791-802.
- Bouret, S., & Sara, S.J. (2005). Network reset: a simplified overarching theory of locus coeruleus-noradrenaline function. *Trends Neurosci*, 28, 574-582.
- Brunia, C.H.M., & van Boxtel, G.J.M. (2000). Motor preparation. In J. T. Cacioppo, L. G. Tassinary, and G. G. Berntson (Eds.), *Handbook of Psychophysiology* (2nd ed., pp. 507-532). New York: Cambridge University Press.
- Buchner, A., Rothermund, K., Wentura, D., & Mehl, B. (2004). Valence of distractor words increases the effects of irrelevant speech on serial recall. *Mem Cognit*, 32, 722-31.
- Burle, B., van den Wildenberg, W., & Ridderinkhof, K.R. (2005). Dynamics of facilitation and interference in cue-priming and Simon tasks. *European Journal of Cognitive Psychology*, 17, 619-641.
- Burle, B., Vidal, F., Tandonnet, C., & Hasbroucq, T. (2004). Physiological evidence for response inhibition in choice reaction time tasks. *Brain and Cognition*, 56, 153-164.
- Buser, P., & Imbert, M. (1961). Sensory projections to the motor cortex in cats: a microelectrode study. In W. A. Rosenblith (Ed.), *Sensory communication* (pp. 607–626). Cambridge, Mass., Massachusetts Institute of Technology.

- Bymaster, F.P., Zhang, W., Carter, P.A., Shaw, J., Chernet, E., Phebus, L., et al (2002). Fluoxetine, but not other selective serotonin uptake inhibitors, increases norepinephrine and dopamine extracellular levels in prefrontal cortex. *Psychopharmacology (Berl)*, 160, 353-361.
- Cahill, L. & McGaugh, J.L. (1998). Mechanisms of emotional arousal and lasting declarative memory. *Trends Neurosci*, 21, 294-9.
- Carpenter, R.H.S., & Williams, M.L.L. (1995). Neural computation of log likelihood in control of saccadic eye movements. *Nature*, 377, 59-62.
- Carter, M.E., Yizhar, O., Chikahisa, S., Nguyen, H., Adamantidis, A., Nishino, S., Deisseroth, K., & de Lecea, L. (2010). Tuning arousal with optogenetic modulation of locus coeruleus neurons. *Nature Neuroscience*, 13, 1526-33.
- Chamberlain SR, Müller U, Blackwell AD, Robbins TW, & Sahakian BJ. (2006). Noradrenergic modulation of working memory and emotional memory in humans. *Psychopharmacology (Berl)*, 188, 397-407.
- Chamberlain, S.R., Müller, U., Blackwell, A.D., Clark, L., Robbins, T.W., & Sahakian, B.J. (2006). Neurochemical modulation of response inhibition and probabilistic learning in humans. *Science*, 311, 861-863.
- Cheshire, W.P. Jr, Dickson, D.W., Nahm, K.F., Kaufmann, H.C., & Benarroch, E.E. (2006). Dopamine beta-hydroxylase deficiency involves the central autonomic network. *Acta Neuropathol*, 112, 227-9.
- Clayton, E.C., Rajkowski, J., Cohen, J.D., & Aston-Jones, G. (2004). Phasic activation of monkey locus coeruleus neurons by simple decisions in a forced choice task. *Journal of Neuroscience*, 24, 9914-9920.
- Cohen, A.F., Ashby, L., Crowley, D., Land, G., Peck, A.W., & Miller, A.A. (1985). Lamotrigine (BW430C), a potential anticonvulsant. Effects on the central nervous system in comparison with phenytoin and diazepam. *Br J Clin Pharmacol*, 20, 619-629.
- Cohen, J.D., Aston-Jones, G., & Gilzenrat, M.S. (2004). A systems-level theory on attention and cognitive control: Guided activation, adaptive gating, conflict monitoring, and exploitation versus exploration. In: Posner MI, editor. *Cognitive neuroscience of attention*. New York: Guilford Press, p. 71-90.
- Cohen, J.D., McClure, S.M., & Yu, A.J. (2007). Should I stay or should I go? How the human brain manages the trade-off between exploitation and exploration. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, 362, 933-942.
- Coles, M.G., Gratton, G., & Donchin, E. (1988). Detecting early communication: using measures of movement-related potentials to illuminate human information processing. *Biological Psychology*, 26, 69-89.
- Collins, R.P., Litman, J.A., & Spielberger, C.D. (2004). The measurement of perceptual curiosity. *Pers Individ Dif*, 36, 1127-1141.
- Colzato, L.S., Slagter, H.A., Spapé, M.M., & Hommel, B. (2008). Blinks of the eye predict blinks of the mind. *Neuropsychologia*, 46, 3179-83.
- Correa, A., Lupiáñez, J., & Tudela, P. (2005). Attentional preparation based on temporal expectancy modulates processing at the perceptual level. *Psychonomic Bulletin & Review*, 12, 328-334.
- Correa, A., Lupiáñez, J., Madrid, E., & Tudela, P. (2006). Temporal attention enhances early visual processing: a review and new evidence from event-related potentials. *Brain Research*, 1076, 116-128.

- Correa, A., Lupiáñez, J., Milliken, B., & Tudela, P. (2004). Endogenous temporal orienting of attention in detection and discrimination tasks. *Perception & Psychophysics*, 66, 264-278.
- Cosgrove, K.P., Mazure, C.M., & Staley, J.K. (2007). Evolving knowledge of sex differences in brain structure, function, and chemistry. *Biol Psychiatry*, 62, 847-55.
- Coull, J.T., Nobre, A.C., & Frith, C.D. (2001). The noradrenergic alpha2 agonist clonidine modulates behavioural and neuroanatomical correlates of human attentional orienting and alerting. *Cerebral Cortex*, 11, 73-84.
- Coull, J.T. (2004). fMRI studies of temporal attention: allocating attention within, or towards, time. *Cognitive Brain Research*, 21, 216-226.
- Coull, J.T., & Nobre, A.C. (1998). Where and when to pay attention: the neural systems for directing attention to spatial locations and to time intervals as revealed by both PET and fMRI. *Journal of Neuroscience*, 18, 7426-7435.
- Counts, S.E., & Mufson, E.J. (2010). Noradrenaline activation of neurotrophic pathways protects against neuronal amyloid toxicity. *J Neurochem*, 113, 649-60.
- Craig, A.D., Reiman, E.M., Evans, A., & Bushnell, M.C. (1996). Functional imaging of an illusion of pain. *Nature*, 384, 258-60.
- Cramer, S.C., Weisskoff, R.M., Schaechter, J.D., Nelles, G., Foley, M., Finklestein, S.P., & Rosen, B.R. (1992). Motor cortex activation is related to force of squeezing. *Human Brain Mapping*, 16, 197-205.
- Crawford, J.R., & Garthwaite, P.H. (2006). Comparing patients' predicted test scores from a regression equation with their obtained scores: a significance test and point estimate of abnormality with accompanying confidence limits. *Neuropsychology*, 20, 259-71.
- Crawford, J.R., & Garthwaite, P.H. (2006a). Methods of testing for a deficit in single case studies: Evaluation of statistical power by Monte Carlo simulation. *Cognitive Neuropsychology*, 23, 877-904.
- Crawford, J.R., & Garthwaite, P.H. (2005). Testing for suspected impairments and dissociations in single-case studies in neuropsychology: Evaluation of alternatives using Monte Carlo simulations and revised tests for dissociations. *Neuropsychology*, 19, 318-31.
- Crawford, J.R., & Howell, D.C. (1998). Comparing an individual's test score against norms derived from small samples. *Clin Neuropsychol*, 12, 482-86.
- Critchley, H., Mathias, C.J., & Dolan, R.J. (2000). Congenital dopamine- $\beta$ -hydroxylase deficiency and schizotypy. *Schizophr Res*, 41, 254.
- Critchley, H.D. (2005). Neural mechanisms of autonomic, affective, and cognitive integration. *J Comp Neurol*, 493, 154-66.
- Critchley, H.D., Tang, J., Glaser, D., Butterworth, B., & Dolan, R.J. (2005). Anterior cingulate activity during error and autonomic response. *Neuroimage*, 27, 885-895.
- Cubells, J.F., & Zabetian, C.P. (2004). Human genetics of plasma dopamine beta-hydroxylase activity: applications to research in psychiatry and neurology. *Psychopharmacology (Berl)*, 174, 463-76.
- Daffner, K.R., Mesulam, M.M., Scinto, L.F., Cohen, L.G., Kennedy, B.P., West, W.C., & Holcomb, P.J. (1998). Regulation of attention to novel stimuli by frontal lobes: an event-related potential study. *Neuroreport*, 9, 787-91.
- Dalton, P., & Spence, C. (2007). Attentional capture in serial audiovisual search tasks. *Perception & Psychophysics*, 69, 422-438.
- Davis, R., & Green, F.A. (1969). Intersensory differences in the effect of warning signals on reaction time. *Acta Psychologica*, 30, 155-167.

- Davranche, K., Tandonnet, C., Burle, B., Meynier, C., Vidal, F., & Hasbroucq, T. (2007). The dual nature of time preparation: neural activation and suppression revealed by transcranial magnetic stimulation of the motor cortex. *European Journal of Neuroscience*, 25, 3766-3774.
- Daw, N.D. & Doya, K. (2006). The computational neurobiology of learning and reward. *Curr Opin Neurobiol*, 16, 199-204.
- Daw, N.D., O'Doherty, J.P., Dayan, P., Seymour, B., & Dolan, R.J. (2006). Cortical substrates for exploratory decisions in humans. *Nature*, 441, 876-479.
- Dayan P & Abbott LF (2001): *Theoretical Neuroscience: Computational and Mathematical Modeling of Neural Systems* (Chapter 9). London: The MIT Press,
- Dayan, P. & Yu, A.J. (2006). Phasic norepinephrine: a neural interrupt signal for unexpected events. *Network*, 17, 335-50.
- De Jong, R. (1991). Partial information or facilitation? Different interpretations of results from speed-accuracy decomposition. *Perception & Psychophysics*, 50, 333-350.
- De Jong, R., Liang, C. C., & Lauber, E. (1994). Conditional and unconditional automaticity: a dual-process model of effects of spatial stimulus response correspondence. *Journal of Experimental Psychology: Human Perception and Performance*, 20, 731-750.
- De Martino, B., Strange, B.A., & Dolan, R.J. (2008). Noradrenergic neuromodulation of human attention for emotional and neutral stimuli. *Psychopharmacology (Berl)*, 197, 127-136.
- Devaugens, V. & Sara, S.J. (1990). Activation of the noradrenergic system facilitates an attentional shift in the rat. *Behavioural Brain Research*, 39, 19-28.
- Dolcos, F., & McCarthy, G. (2006). Brain systems mediating cognitive interference by emotional distraction. *J Neurosci*, 26, 2072-9.
- Dostert, P., Benedetti, M.S., & Poggesi, I. (1997). Review of the pharmacokinetics and metabolism of reboxetine, a selective noradrenaline reuptake inhibitor. *Eur Neuropsychopharmacol*, 7 (suppl 1), S23-S35.
- Doya, K. (2002). Metalearning and neuromodulation. *Neural Networks*, 15, 495-506.
- Dreisbach, G., Müller, J., Goschke, T., Strobel, A., Schulze, K., Lesch, K.P., & Brocke, B. (2005). Dopamine and cognitive control: the influence of spontaneous eyeblink rate and dopamine gene polymorphisms on perseveration and distractibility. *Behavioral Neuroscience*, 119, 483-490.
- Duffy, E. (1957). The psychological significance of the concept of arousal or activation. *Psychological Review*, 64, 265-75
- Edwards, D.M., Pellizzoni, C., Breuel, H.P., Berardi, A., Castelli, M.G., Frigerio, E., et al (1995). Pharmacokinetics of reboxetine in healthy volunteers. Single oral doses, linearity and plasma protein binding. *Biopharm Drug Dispos*, 16, 443-460.
- Efron, B., & Tibshirani, R.J. (1993). *An Introduction to the Bootstrap*. London: Chapman & Hall.
- Einhäuser, W., Stout, J., Koch, C., & Carter, O. (2008). Pupil dilation reflects perceptual selection and predicts subsequent stability in perceptual rivalry. *Proceedings of the National Academy of Sciences of the USA*, 105, 1704-1709.
- Eisenberger, N.I., Lieberman, M.D., & Williams, K.D. (2003). Does rejection hurt? An FMRI study of social exclusion. *Science* 302, 290-2.
- Elam, M., Svensson, T.H., & Thorén, P. (1986). Locus coeruleus neurons and sympathetic nerves: activation by cutaneous sensory afferents. *Brain Research*, 366, 254-261.
- Ennaceur A., & Delacour J. (1988). A new one-trial test for neurobiological studies of memory in rats. 1: Behavioral data. *Behavioural Brain Research*, 31, 47-59.

- Erez, A., Li, J., Geraghty, M.T., Ben-Shachar, S., Cooper, M.L., Mensing, D.E., et al. (2010). Mosaic deletion 11p13 in a child with dopamine beta-hydroxylase deficiency--case report and review of the literature. *Am J Med Genet A*, 152A, 732-6.
- Eriksen, C.W., & Schultz, D.W. (1979). Information processing in visual search: a continuous flow conception and experimental results. *Perception & Psychophysics*, 25, 249-263.
- Ermolaeva, V.Y., Tolchenova, G.A., & Brukhanskaya, N.A. (1981). Cortico-cortical connections between the auditory fields and the sensorimotor region of the cortex. *Neuroscience and Behavioral Physiology*, 11, 514-520.
- Falchier, A., Clavagnier, S., Barone, P., & Kennedy, H. (2002). Anatomical evidence of multimodal integration in primate striate cortex. *Journal of Neuroscience*, 22, 5749-5759.
- Farrell, S., & Ludwig, C.J.H. (2008). Bayesian and maximum likelihood estimation of hierarchical response time models. *Psychonomic Bulletin & Review*, 15, 1209-1217.
- Fernandez-Duque, D., & Posner, M.I. (1997). Relating the mechanisms of orienting and alerting. *Neuropsychologia*, 35, 477-86.
- Flicker, C., & Geyer, M.A. (1982). Behavior during hippocampal microinfusions. I. Norepinephrine and diversive exploration. *Brain Research*, 257, 79-103.
- Frank, M.J., Doll, B.B., Oas-Terpstra, J., & Moreno, F. (2009). Prefrontal and striatal dopaminergic genes predict individual differences in exploration and exploitation. *Nature Neuroscience*, 12, 1062-1068.
- Gelman, A., & Hill, J. (2007). Data analysis using regression and multilevel/hierarchical models. Cambridge: Cambridge University Press.
- Gelman, A., & Rubin, D.B. (1992). Inference from iterative simulation using multiple sequences. *Statistical Science*, 7, 457-472.
- Gevins, A. (1989). Dynamic functional topography of cognitive tasks. *Brain Topography*, 2, 37-56.
- Ghazanfar, A.A., and Schroeder, C.E. (2006). Is neocortex essentially multisensory? *Trends in Cognitive Sciences*, 10, 278-285.
- Ghose, G.M., & Maunsell, J.H. (2002). Attentional modulation in visual cortex depends on task timing. *Nature*, 419, 616-620.
- Giard, M.H., Perrin, F., Echallier, J. F., Thévenet, M., Froment, J.C., & Pernier, J. (1994). Dissociation of temporal and frontal components in the human auditory N1 wave: a scalp current density and dipole model analysis. *Electroencephalography and Clinical Neurophysiology*, 92, 238-252.
- Giard, M.H., & Peronnet, F. (1999). Auditory-visual integration during multimodal object recognition in humans: a behavioral and electrophysiological study. *Journal of Cognitive Neuroscience*, 11, 473-490.
- Gilzenrat, M.S., Nieuwenhuis, S., Jepma, M., & Cohen, J.D. (2010). Pupil diameter tracks changes in control state predicted by the adaptive gain theory of locus coeruleus function. *Cognitive, Affective & Behavioral Neuroscience*, 10, 252-269.
- Gold, J.I., & Shadlen, M.N. (2007). The neural basis of decision making. *Annual Review of Neuroscience*, 30, 535-574.
- Goldstein, D.S. (2006). L-Dihydroxyphenylserine (L-DOPS): a norepinephrine prodrug. *Cardiovasc Drug Rev*, 24, 189-203.
- Gomez, P., Ratcliff, R., & Perea, M. (2007). A model of the go/no-go task. *Journal of Experimental Psychology. General*, 136, 389-413.

- Gompf, H.S., Mathai, C., Fuller, P.M., Wood, D.A., Pedersen, N.P., Saper, C.B., & Lu, J. (2010). Locus ceruleus and anterior cingulate cortex sustain wakefulness in a novel environment. *Journal of Neuroscience*, 30, 14543-51.
- Good, C.D., Johnsrude, I.S., Ashburner, J., Henson, R.N., Friston, K.J., & Frackowiak, R.S. (2001). A voxel-based morphometric study of ageing in 465 normal adult human brains. *Neuroimage*, 14, 21-36.
- Gottsdanker, R. (1975). The attaining and maintaining of preparation. In: P. Rabbitt and S. Dornic (Eds.) *Attention and Performance V*. London: Academic Press, pp. 33-49.
- Grant, S.J., Aston-Jones, G., & Redmond, D.E. Jr. (1988). Responses of primate locus coeruleus neurons to simple and complex sensory stimuli. *Brain Research Bulletin*, 21, 401-10.
- Gratton, G., Coles, M.G., & Donchin, E. (1983). A new method for off-line removal of ocular artifact. *Electroencephalography and Clinical Neurophysiology*, 55, 468-484.
- Gratton, G., Coles, M.G., Sirevaag, E.J., Eriksen, C.W., & Donchin, E. (1988). Pre- and poststimulus activation of response channels: a psychophysiological analysis. *Journal of Experimental Psychology: Human Perception and Performance*, 14, 331-344.
- Greene, C.M., Bellgrove, M.A., Gill, M., & Robertson, I.H. (2009). Noradrenergic genotype predicts lapses in sustained attention. *Neuropsychologia*, 47, 591-4.
- Greenwood, P.M., Fossella, J.A., & Parasuraman, R. (2005). Specificity of the effect of a nicotinic receptor polymorphism on individual differences in visuospatial attention. *J Cogn Neurosci*, 17, 1611-20.
- Grosjean, M., Rosenbaum, D.A., & Elsinger, C. (2001). Timing and reaction time. *Journal of Experimental Psychology: General*, 130, 256-272.
- Hackley, S.A., & Valle-Inclán, F. (1998). Automatic alerting does not speed late motoric processes in a reaction-time task. *Nature*, 391, 786-788.
- Hackley, S.A., & Valle-Inclán, F. (1999). Accessory stimulus effects on response selection: Does arousal speed decision making? *Journal of Cognitive Neuroscience*, 11, 321-329.
- Hackley, S.A., & Valle-Inclán, F. (2003). Which stages of processing are speeded by a warning signal? *Biological Psychology*, 64, 27-45.
- Hackley, S.A. (2009). The speeding of voluntary reaction by a warning signal. *Psychophysiology*, 46, 225-233.
- Hackley, S.A., Langner, R., Rolke, B., Erb, M., Grodd, W., & Ulrich, R. (2009). Separation of phasic arousal and expectancy effects in a speeded reaction time task via fMRI. *Psychophysiology*, 46, 163-171.
- Hackley, S.A., Schankin, A., Wohlschlaeger, A., & Wascher, E. (2007). Localization of temporal preparation effects via trisectioned reaction time. *Psychophysiology*, 44, 334-338.
- Haruno, M. & Kawato, M. (2006). Different neural correlates of reward expectation and reward expectation error in the putamen and caudate nucleus during stimulus-action-reward association learning. *J Neurophysiol* 95, 948-59
- Hasbroucq, T., Akamatsu, M., Mouret, I., & Seal, J. (1995). Finger pairings in choice reaction time tasks: does the between-hands advantage reflect response preparation? *Journal of Motor Behavior*, 27, 251-262.
- Heathcote, A. (2004). Fitting Wald and ex-Wald distributions to response time data: An example using functions for the S-PLUS package. *Behavior Research Methods, Instruments, & Computers*, 36, 678-694.
- Hess, E.H., & Polt, J.M. (1964). Pupil Size in Relation to Mental Activity during Simple Problem-Solving. *Science*, 143, 1190-2.

- Hjorth, B. (1975). An on-line transformation of EEG scalp potentials into orthogonal source derivations. *Electroencephalography and Clinical Neurophysiology*, 39, 526-30.
- Hobson, J.A., Lydic, R., & Bahdoyan, H.A. (1986). Evolving concepts of sleep cycle generation: from brain centers to neuronal population. *Behav Brain Sci*, 9, 371-448.
- Hobson, J.A., McCarley, R.W., & Wyzinski, P.W. (1975). Sleep cycle oscillation: reciprocal discharge by two brainstem neuronal groups. *Science*, 189, 55-8.
- Hodges, P.W., & Bui, B.H. (1996). A comparison of computer-based methods for the determination of onset of muscle contraction using electromyography. *Electroencephalography and Clinical Neurophysiology*, 101, 511-9.
- Hoffman, B.B., & Taylor, P. (2001). Neurotransmission: the autonomic and somatic motor nervous system. In: Hardman, J.G., Limbird, L.E., Molinoff, P.B., Gilman, A.G. Goodman & Gilman's the Pharmacological Basis of Therapeutics. New York: McGraw-Hill. p. 115-53.
- Hohle, R.H. (1965). Inferred components of reaction time as functions of foreperiod duration. *Journal of Experimental Psychology*, 69, 382-386.
- Holmes, C., Eisenhofer, G., & Goldstein, D.S. (1994). Improved assay for plasma dihydroxyphenylacetic acid and other catechols using high-performance liquid chromatography with electrochemical detection. *J Chromatogr B Biomed Appl*, 653, 131-8.
- Hommel, B., & Akyürek, E.G. (2005). Lag-1 sparing in the attentional blink: benefits and costs of integrating two events into a single episode. *Q J Exp Psychol A*, 58, 1415-33.
- Howard, I.P., & Templeton, W.B. (1966). Human Spatial Orientation. Wiley, New York.
- Hughes RN. (2007). Neotic preferences in laboratory rodents: issues, assessment and substrates. *Neuroscience and Biobehavioral Reviews*, 31, 441-64.
- Hyttel, J. (1994). Pharmacological characterization of selective serotonin reuptake inhibitors (SSRIs). *Int Clin Psychopharmacol*, 9 (suppl 1), 19-26.
- Invernizzi, R.W., & Garattini, S. (2004). Role of presynaptic alpha2-adrenoceptors in antidepressant action: recent findings from microdialysis studies. *Prog Neuropsychopharmacol Biol Psychiatry*, 28, 819-827.
- Ishikawa, Y., Kato, Y., Murakami, Y., Inoue, T., Koshiyama, H., & Imura, H. (1987). Effect of L-threo-3,4-dihydroxyphenylserine (L-DOPS) on catecholamine levels in plasma and cerebrospinal fluid (CSF) in anesthetized rats. *Proc Soc Exp Biol Med*, 184, 197-200.
- Itil, T.M., Menon, G.N., Bozak, M.M., & Itil, K.Z. (1984). CNS effects of citalopram, a new serotonin inhibitor antidepressant (a quantitative pharmaco-electroencephalography study). *Prog Neuropsychopharmacol Biol Psychiatry*, 8, 397-409.
- Janisse, M.P. (1977). Pupillometry: The Psychology of the Pupillary Response. Washington, D.C.: Hemisphere Publishing Co.
- Janssen, P., & Shadlen, M.N. (2005). A representation of the hazard rate of elapsed time in macaque area LIP. *Nature Neuroscience*, 8, 234-241.
- Jaśkowski, P., Kurczewska, M., Nowik, A., van der Lubbe, R.H., & Verleger, R. (2007). Locus of the intensity effect in simple reaction time tasks. *Perception and Psychophysics*, 69, 1334-1343.
- Jenkinson, M., & Smith, S.M. (2001). A global optimisation method for robust affine registration of brain images. *Med Image Anal*, 5, 143-56.
- Jenkinson, M., Bannister, P., Brady, M., & Smith, S.M. (2002). Improved optimization for the robust and accurate linear registration and motion correction of brain images. *Neuroimage*, 17, 825-41.

- Jepma, M., & Nieuwenhuis, S. (in press). Pupil diameter predicts changes in the exploration-exploitation trade-off: Evidence for the adaptive gain theory. *J Cogn Neurosci*
- Jepma, M., Wagenmakers, E.-J., Band, G.P.H., & Nieuwenhuis, S. (2009). The effects of accessory stimuli on information processing: Evidence from electrophysiology and a diffusion-model analysis. *Journal of Cognitive Neuroscience*, 21, 847-864.
- Jouvet, M. (1969). Biogenic amines and the states of sleep. *Science*, 163, 32-41.
- Kahneman, D. & Beatty, J. (1967). Pupillary responses in a pitch-discrimination task. *Percept Psychophys*, 2, 101-5.
- Kahneman, D. (1973). Attention and Effort. Englewood Cliffs, NJ: Prentice-Hall.
- Kakade, S., & Dayan, P. (2002). Dopamine: generalization and bonuses. *Neural Netw*, 15, 549-59.
- Kalinin, S., Gavrilyuk, V., Polak, P.E., Vasser, R., Zhao, J., Heneka, M.T., et al. (2007). Noradrenaline deficiency in brain increases beta-amyloid plaque burden in an animal model of Alzheimer's disease. *Neurobiol Aging*, 28, 1206-14.
- Kang, M.J., Hsum, M., Krajbich, I.M., Loewenstein, G., McClure, S.M., Wang, J.T., & Camerer, C.F. (2009). The wick in the candle of learning: epistemic curiosity activates reward circuitry and enhances memory. *Psychol Sci*, 20, 963-73.
- Karlin, L. (1959). Reaction time as a function of foreperiod duration and variability. *Journal of Experimental Psychology*, 58, 185-191.
- Kato, T., Karai, N., Katsuyama, M., Nakamura, M., & Katsume, J. (1987a). Studies on the activity of L-threo-3,4-dihydroxyphenylserine (L-DOPS) as a catecholamine precursor in the brain. Comparison with that of L-dopa. *Biochem Pharmacol*, 36, 3051-7.
- Kato, T., Katsuyama, M., Karai, N., Nakamura, M., & Katsume, J. (1987b). Studies on the central action of L-threo-3,4-dihydroxyphenyl-serine (L-threo-DOPS) in FLA-63-treated mice. *Pharmacol Biochem Behav*, 26, 407-11.
- Klemmer, E.T. (1956). Time uncertainty in simple reaction time. *Journal of Experimental Psychology*, 51, 179-84.
- Kubiak, P., Rajkowski, J., & Aston-Jones, G. (1992). Behavioral performance and sensory responsiveness of LC neurons in a vigilance task varies with tonic LC discharge rate. *Soc Neurosci Abstr*, 18, 538.
- Lagarias, J.C., Reeds, J.A., Wright, M.H., & Wright, P.E. (1998). Convergence Properties of the Nelder-Mead Simplex Method in Low Dimensions. *SIAM J. Optim*, 9, 112-147.
- Laming, D. (1979). Choice reaction performance following an error. *Acta Psychologica*, 43, 199-224.
- Laming, D.R.J. (1968). Information theory of choice reaction time. New York: Wiley.
- Lang, P.J., Bradley, M.M., & Cuthbert, B.N. (2005). International Affective Picture System (IAPS): Digitized photographs, instruction manual, and affective ratings (Tech. Rep. No. A-6). Gainesville: University of Florida, Center for Research in Psychophysiology.
- Lapiz, M.D., & Morilak, D.A. (2006). Noradrenergic modulation of cognitive function in rat medial prefrontal cortex as measured by attentional set shifting capability. *Neuroscience*, 137, 1039-1049.
- Lapiz, M.D., Bondi, C.O., & Morilak, D.A. (2007). Chronic treatment with desipramine improves cognitive performance of rats in an attentional set-shifting test. *Neuropsychopharmacology (Berl, Ger)*, 32, 1000-1010.
- Leth-StENSEN, C. (2009). Lengthening fixed preparatory foreperiod durations within a digit magnitude classification task serves mainly to shift distributions of response times upwards. *Acta Psychologica*, 130, 72-80.

- Litman, J.A. (2008). Interest and deprivation factors of epistemic curiosity, *Pers Individ Dif*, 44, 1585–95.
- Liu, J., Kiehl, K.A., Pearson, G., Perrone-Bizzozero, N.I., Eichele, T., & Calhoun, V.D. (2009). Genetic determinants of target and novelty-related event-related potentials in the auditory oddball response. *Neuroimage*, 46, 809-16.
- Loewenfeld, I. (1993). *The Pupil: Anatomy, Physiology, and Clinical Applications*. Detroit: Wayne State University Press.
- Loewenstein, G. (1994). The Psychology of curiosity: A review and reinterpretation. *Psychol Bull*, 116, 75-98.
- Lorch, R.F., & Myers, J.L. (1990). Regression-analyses of repeated measures data in cognitive research. *Journal of Experimental Psychology: Learning Memory and Cognition*, 16, 149-157.
- Low, K.A., Larson, S.L., Burke, J., & Hackley, S.A. (1996). Alerting effects on choice reaction time and the photic eyeblink reflex. *Electroencephalography and Clinical Neurophysiology*, 98, 385-393.
- Luce, R.D. (1986). Response times: Their role in inferring elementary mental organization. New York: Oxford University Press.
- Luksys, G., Gerstner, W., & Sandi, C. (2009). Stress, genotype and norepinephrine in the prediction of mouse behavior using reinforcement learning. *Nat Neurosci*, 12, 1180-1186.
- Lunn, D.J., Spiegelhalter, D., Thomas, A., & Best, N. (2009). The BUGS project: Evolution, critique and future directions. *Statistics in Medicine*, 28, 3049-3067.
- Lunn, D.J., Thomas, A., Best, N., & Spiegelhalter, D. (2000). WinBUGS—A Bayesian modelling framework: Concepts, structure, and extensibility. *Statistics & Computing*, 10, 325-337.
- Lynn, R. (1966). Attention, arousal, and the orientation reaction. Oxford: Pergamon Press.
- Maclean, M.H., & Arnell, K.M. (2010). Personality predicts temporal attention costs in the attentional blink paradigm. *Psychon Bull Rev*, 17, 556-62.
- Madrigal, J.L., Kalinin, S., Richardson, J.C., & Feinstein, D.L. (2007). Neuroprotective actions of noradrenaline: effects on glutathione synthesis and activation of peroxisome proliferator activated receptor delta. *J Neurochem*, 103, 2092–2101.
- Madrigal, J.L., Leza, J.C., Polak, P., Kalinin, S., & Feinstein, D.L. (2009). Astrocyte-derived MCP-1 mediates neuroprotective effects of noradrenaline. *J Neurosci*, 29, 263-267.
- Maier, M.A., Bennett, K.M., Hepp-Reymond, M.C., & Lemon, R.N. (1993). Contribution of the monkey corticomotoneuronal system to the control of force in precision grip. *Journal of Neurophysiology*, 69, 772-785.
- Man in 't Veld, A.J., Boomsma, F., Moleman, P., & Schalekamp, M.A. (1987a). Congenital dopamine-beta hydroxylase deficiency. A novel orthostatic syndrome. *Lancet*, 1, 183-8.
- Man in 't Veld, A.J., Boomsma, F., van den Meiracker, A.H., & Schalekamp, M.A. (1987b). Effect of unnatural noradrenaline precursor on sympathetic control and orthostatic hypotension in dopamine-beta-hydroxylase deficiency. *Lancet*, 2, 1172-5.
- Manjarrez, E., Mendez, I., Martinez, L., Flores, A., & Mirasso, C.R. (2007). Effects of auditory noise on the psychophysical detection of visual signals: cross-modal stochastic resonance. *Neuroscience Letters*, 415, 231-236.
- Mann, T.A. & Walker, P. (2003). Autism and a deficit in broadening the spread of visual attention. *Journal of Child Psychology and Psychiatry*, 44, 274-84.
- Mansour, A.A., Babstock, D.M., Penney, J.H., Martin, G.M., McLean, J.H., & Harley, C.W. (2003). Novel objects in a holeboard probe the role of the locus coeruleus in curiosity: support for two modes of attention in the rat. *Behav Neurosci*, 117, 621-31.

- Marino, M.D., Bourdélat-Parks, B.N., Cameron Liles, L., & Weinshenker, D. (2005). Genetic reduction of noradrenergic function alters social memory and reduces aggression in mice. *Behav Brain Res*, 161, 197-203.
- Martens, S., & Wyble, B. (2010). The attentional blink: past, present, and future of a blind spot in perceptual awareness. *Neurosci Biobehav Rev*, 34, 947-57.
- Martens, S., & Johnson, A. (2005). Timing attention: cuing target onset interval attenuates the attentional blink. *Memory and Cognition*, 33, 234-240.
- Mathias, C.J., Bannister, R.B., Cortelli, P., Heslop, K., Polak, J.M., Rimbach, S., et al. (1990). Clinical, autonomic and therapeutic observations in two siblings with postural hypotension and sympathetic failure due to an inability to synthesize noradrenaline from dopamine because of a deficiency of dopamine beta hydroxylase. *Q J Med*, 75, 617-33.
- Mattes, S., & Ulrich, R. (1997). Response force is sensitive to the temporal uncertainty of response stimuli. *Perception and Psychophysics*, 59, 1089-1097.
- McClure, S., Gilzenrat, M., & Cohen, J. (2005). An exploration-exploitation model based on norepinephrine and dopamine activity. In Y. Weiss, B. Schölkopf, & J. Platt (Eds.), *Advances in neural information processing systems*, 18, pp 867-874. Cambridge, MA: MIT Press.
- McDonald, J.J., Teder-Sälejärvi, W.A., Di Russo, F., & Hillyard, S.A. (2005). Neural basis of auditory-induced shifts in visual time-order perception. *Nature Neuroscience*, 8, 1197-1202.
- McGaughy, J., Ross, R.S., & Eichenbaum, H. (2008). Noradrenergic, but not cholinergic, deafferentation of prefrontal cortex impairs attentional set-shifting. *Neuroscience*, 153, 63-71.
- McGurk, H., & MacDonald, J. (1976). Hearing lips and seeing voices. *Nature*, 264, 746-748.
- Miller, J. (2007). Contralateral and ipsilateral motor activation in visual simple reaction time: a test of the hemispheric coactivation model. *Experimental Brain Research*, 176, 539-558.
- Miller, J., Franz, V., & Ulrich, R. (1999). Effects of auditory stimulus intensity on response force in simple, go-no-go, and choice tasks. *Perception & Psychophysics*, 61, 107-119.
- Miller, J., Patterson, T., & Ulrich, R. (1998). Jackknife-based method for measuring LRP onset latency differences. *Psychophysiology*, 35, 99-115.
- Miniussi, C., Wilding, E.L., Coull, J.T., & Nobre, A.C. (1999). Orienting attention in time: modulation of brain potentials. *Brain*, 122, 1507-1518.
- Miskowiak, K., Papadatou-Pastou, M., Cowen, P.J., Goodwin, G.M., Norbury, R., & Harmer, C.J. (2007). Single dose antidepressant administration modulates the neural processing of self-referent personality trait words. *Neuroimage*, 37, 904-911.
- Mordkoff, J.T., & Grosjean, M. (2001). The lateralized readiness potential and response kinetics in response-time tasks. *Psychophysiology*, 38, 777-786.
- Morrell, F. (1972). Visual system's view of acoustic space. *Nature*, 238, 44-46.
- Morrell, L.K. (1968). Temporal characteristics of sensory interaction in choice reaction times. *Journal of Experimental Psychology*, 77, 14-18.
- Moss, F., Ward, L.M., & Sannita, W.G. (2004). Stochastic resonance and sensory information processing: a tutorial and review of application. *Clinical Neurophysiology*, 115, 267-281.
- Müller-Gethmann, H., Ulrich, R., & Rinkenauer, G. (2003). Locus of the effect of temporal preparation: evidence from the lateralized readiness potential. *Psychophysiology*, 40, 597-611.
- Murchison, C.F., Zhang, X.Y., Zhang, W.P., Ouyang, M., Lee, A., & Thomas, S.A. (2004). A distinct role for norepinephrine in memory retrieval. *Cell*, 117, 131-43.

- Näätänen, R. (1971). Non-aging fore-periods and simple reaction time. *Acta Psychologica*, 35, 316–327.
- Näätänen, R. (1972). Time uncertainty and occurrence uncertainty of the stimulus in a simple reaction-time task. *Acta Psychologica*, 36, 492-503.
- Neiss, R. (1988). Reconceptualizing arousal: Psychological states in motor performance. *Psychological Bulletin*, 103, 345–366.
- Newman, L.A., Darling, J., & McGaughy, J. (2008). Atomoxetine reverses attentional deficits produced by noradrenergic deafferentation of medial prefrontal cortex. *Psychopharmacology (Berl)*, 200, 39-50.
- Nicki, R.M. (1970). The reinforcing effect of uncertainty reduction on a human operant. *Can J Psychol*, 24, 389-399.
- Niemi, P., & Näätänen, R. (1981). Foreperiod and simple reaction time. *Psychological Bulletin*, 89, 133–162.
- Nieuwenhuis, S., Aston-Jones, G., & Cohen, J.D. (2005b). Decision making, the P3, and the locus coeruleus norepinephrine system. *Psychol Bull*, 131: 510-32.
- Nieuwenhuis, S., Gilzenrat, M.S., Holmes, B.D., & Cohen, J.D. (2005a). The role of the locus coeruleus in mediating the attentional blink: a neurocomputational theory. *J Exp Psychol Gen*, 134, 291-307.
- Nieuwenhuis, S., de Geus, E.J., & Aston-Jones, G. (in press). The anatomical and functional relationship between the P3 and autonomic components of the orienting response. *Psychophysiology*.
- Nieuwenhuis, S., van Nieuwpoort, I.C., Veltman, D.J., & Drent, M.L. (2007). Effects of the noradrenergic agonist clonidine on temporal and spatial attention. *Psychopharmacology (Berl)*, 193, 261-9.
- Noble, S., & Benfield, P. (1997). Citalopram: A review of its pharmacology, clinical efficacy and tolerability in the treatment of depression. *CNS Drugs*, 8, 410–431.
- Nobre, A., Correa, A., & Coull, J. (2007). The hazards of time. *Current Opinion in Neurobiology*, 17, 465-470.
- O'Doherty, J.P. (2004). Reward representations and reward-related learning in the human brain: insights from neuroimaging. *Curr Opin Neurobiol*, 14, 769-76.
- Oei, N.Y., Tollenaar, M.S., Elzinga, B.M., & Spinhoven, P. (2010). Propranolol reduces emotional distraction in working memory: a partial mediating role of propranolol-induced cortisol increases? *Neurobiol Learn Mem*, 93, 388-95.
- Oei, N.Y., Tollenaar, M.S., Spinhoven, P., & Elzinga, B.M. (2009). Hydrocortisone reduces emotional distracter interference in working memory. *Psychoneuroendocrinology*, 34, 1284-93.
- Ordway, G.A., Schenk, J., Stockmeier, C.A., May, W., & Klimek, V. (2003). Elevated agonist binding to alpha2-adrenoceptors in the locus coeruleus in major depression. *Biological Psychiatry*, 53, 315-23.
- Page, M.E., & Lucki, I. (2002). Effects of acute and chronic reboxetine treatment on stress-induced monoamine efflux in the rat frontal cortex. *Neuropsychopharmacology*, 27, 237-247.
- Parasuraman, R., Greenwood, P.M., Kumar, R., & Fossella, J. (2005). Beyond heritability: neurotransmitter genes differentially modulate visuospatial attention and working memory. *Psychol Sci*, 16, 200-7.
- Parmentier, F.B., Elford, G., Escera, C., Andrés, P., & San Miguel, I. (2008). The cognitive locus of distraction by acoustic novelty in the cross-modal oddball task. *Cognition*, 106, 408-32.

- Pavlov, I.P. (1927). Conditioned reflexes. Oxford: Clarendon Press.
- Peck, O.F. (1970). The conversation of Progressive Matrices and Mill Hill Vocabulary raw scores into deviation IQs. *Journal of Clinical Psychology*, 26, 67-70.
- Peeters, F.P.M.L., Ponds, R.W.H.M., & Vermeeren, M.T.G. (1996). Affectivity and self-report of depression and anxiety (Dutch). *Tijdschr Psych*, 38, 240-50.
- Perrin, F., Pernier, J., Bertrand, O., & Echallier, J.F. (1989). Spherical splines for scalp potential and current density mapping. *Electroencephalography and Clinical Neurophysiology*, 72, 184-187.
- Phillips, M.A., Bitsios, P., Szabadi, E., & Bradshaw, C.M. (2000). Comparison of the antidepressants reboxetine, fluvoxamine and amitriptyline upon spontaneous pupillary fluctuations in healthy human volunteers. *Psychopharmacology (Berl)*, 149, 72-76.
- Pineda, J.A., Foote, S.L., & Neville, H.J. (1989). Effects of locus coeruleus lesions on auditory, long-latency, event-related potentials in monkey. *J Neurosci*, 9, 81-93.
- Ploghaus, A., Tracey, I., Gati, J.S., Clare, S., Menon, R.S., Matthews, P.M., & Rawlins, J.N. (1999). Dissociating pain from its anticipation in the human brain. *Science*, 284, 1979-81.
- Posner, M.I. (1978). Chronometric explorations of mind. Hillsdale, NJ: Erlbaum.
- Posner, M.I., Klein, R., Summers, J. & Buggie, S. (1973). On the selection of signals. *Memory and Cognition*, 1, 2-12.
- Pribram, K.H., & McGuinness, D. (1975). Arousal, activation, and effort in the control of attention. *Psychological Review*, 82, 116-149.
- Raftery, A.E. (1996). Approximate Bayes factors and accounting for model uncertainty in generalized linear models. *Biometrika*, 83, 251-266.
- Raichle, M.E., MacLeod, A.M., Snyder, A.Z., Powers, W.J., Gusnard, D.A., & Shulman, G.L. (2001). A default mode of brain function. *Proc Natl Acad Sci USA*, 98, 676-82.
- Rajkowski, J., Kubiak, P., & Aston-Jones, G. (1993). Correlations between locus coeruleus (LC) neural activity, pupil diameter and behavior in monkey support a role of LC in attention. *Society for Neuroscience Abstracts*, 19, 974.
- Rajkowski, J., Kubiak, P., & Aston-Jones, G. (1994). Locus coeruleus activity in monkey: phasic and tonic changes are associated with altered vigilance. *Brain Research Bulletin*, 35, 607-616.
- Rajkowski, J., Lu, W., Zhu, Y., Cohen, J.D., & Aston-Jones, G. (2000). Prominent projections from the anterior cingulate cortex to the locus coeruleus (LC) in rhesus monkey. *Society for Neuroscience Abstracts*, 26, 2230.
- Rajkowski, J., Majczynski, H., Clayton, E., & Aston-Jones, G. (2004). Activation of monkey locus coeruleus neurons varies with difficulty and performance in a target detection task. *Journal of Neurophysiology*, 92, 361-71.
- Ratcliff, R. (1978). A theory of memory retrieval. *Psychological Review*, 85, 59-108.
- Ratcliff, R. (1979). Group reaction time distributions and an analysis of distribution statistics. *Psychological Bulletin*, 86, 446-461.
- Ratcliff, R. (2002). A diffusion model account of response time and accuracy in a brightness discrimination task: fitting real data and failing to fit fake but plausible data. *Psychonomic Bulletin & Review*, 9, 278-291.
- Ratcliff, R., & Rouder, J.N. (1998). Modeling response times for two-choice decisions. *Psychological Science*, 9, 347-356.
- Ratcliff, R., & Tuerlinckx, F. (2002). Estimating parameters of the diffusion model: Approaches to dealing with contaminant reaction times and parameter variability. *Psychonomic Bulletin & Review*, 9, 438-481.

- Ratcliff, R., Gomez, P., & McKoon, G. (2004). A diffusion model account of the lexical decision task. *Psychological Review*, 111, 159-82.
- Ratcliff, R., Thapar, A., & McKoon, G. (2001). The effects of aging on reaction time in a signal detection task. *Psychology and Aging*, 16, 323-341.
- Ratcliff, R., Thapar, A., Gomez, P., & McKoon, G. (2004). A diffusion model analysis of the effects of aging in the lexical-decision task. *Psychology and Aging*, 19, 278-289.
- Ratcliff, R., Van Zandt, T., & McKoon, G. (1999). Connectionist and diffusion models of reaction time. *Psychological Review*, 106, 261-300.
- Raven, J.C., Court, J.H., & Raven, J. Manual for Raven's progressive matrices and vocabulary scales: Section 3 Standard progressive matrices. London: Lewis; 1988.
- Raymond, J.E., Shapiro, K.L., & Arnell, K.M. (1992). Temporary suppression of visual processing in an RSVP task: an attentional blink? *J Exp Psychol Hum Percept Perform*, 18, 849-60.
- Reiner, P.B. (1986). Correlational analysis of central noradrenergic neuronal activity and sympathetic tone in behaving cats. *Brain Research*, 378, 86-96.
- Ressler, K.J., & Nemeroff, C.B. (2001). Role of norepinephrine in the pathophysiology of neuropsychiatric disorders. *CNS Spectr*, 6, 663-6.
- Ridderinkhof, K.R. (2002). Activation and suppression in conflict tasks: Empirical clarification through distributional analyses. In W. Prinz & B. Hommel (Eds.), *Common mechanisms in perception and action. Volume 19: Attention & performance* (pp. 494–519). Oxford: Oxford University Press.
- Ridderinkhof, K.R., Ullsperger, M., Crone, E.A., & Nieuwenhuis, S. (2004). The role of the medial frontal cortex in cognitive control. *Science*, 306, 443-447.
- Riehle, A., Grün, S., Diesmann, M., & Aertsen, A. (1997). Spike synchronization and rate modulation differentially involved in motor cortical function. *Science*, 278, 1950-1953.
- Robbins, T.W., & Arnsten, A.F. (2009). The neuropsychopharmacology of fronto-executive function: monoaminergic modulation. *Annu Rev Neurosci*, 32, 267-87.
- Robbins, T.W. (1997). Arousal systems and attentional processes. *Biological Psychology*, 45, 57-71.
- Robertson, D., Goldberg, M.R., Onrot, J., Hollister, A.S., Wiley, R., Thompson, J.G. Jr, et al. (1986). Isolated failure of autonomic noradrenergic neurotransmission. Evidence for impaired beta-hydroxylation of dopamine. *N Engl J Med*, 314, 1494-7.
- Rockland, K.S., and Ojima, H. (2003). Multisensory convergence in calcarine visual areas in macaque monkey. *International Journal of Psychophysiology*, 50, 19-26.
- Rolke, B. (2008). Temporal preparation facilitates perceptual identification of letters. *Perception & Psychophysics*, 70, 1305-1313.
- Rolke, B., & Hofmann, P. (2007). Temporal uncertainty degrades perceptual processing. *Psychonomic Bulletin and Review*, 14, 522-526.
- Roman, T., Schmitz, M., Polanczyk, G.V., Eizirik, M., Rohde, L.A., & Hutz, M.H. (2002). Further evidence for the association between attention-deficit/hyperactivity disorder and the dopamine-beta-hydroxylase gene. *Am J Med Genet*, 114, 154-8.
- Rosson, B., & Pourtois, G. (2004). Revisiting Snodgrass and Vanderwart's object pictorial set: the role of surface detail in basic-level object recognition. *Perception*, 33, 217-36.
- Roth, W.T., Dorato, K.H., & Kopell, B.S. (1984). Intensity and task effects on evoked physiological responses to noise bursts. *Psychophysiology*, 21, 466-81.
- Rouder, J.N., Lu, J., Speckman, P., Sun, D., & Jiang, Y. (2005). A hierarchical model for estimating response time distributions. *Psychonomic Bulletin & Review*, 12, 195-223.

- Rouder, J.N., Sun, D., Speckman, P.L., Lu, J., & Zhou, D. (2003). A hierarchical Bayesian statistical framework for response time distributions. *Psychometrika*, 68, 589-606.
- Rudell, A.P., and Hu, B. (2001). Does a warning signal accelerate the processing of sensory information? Evidence from recognition potential responses to high and low frequency words. *International Journal of Psychophysiology*, 41, 31-42.
- Saletu, B., Anderer, P., Saletu-Zyhlarz, G.M., Arnold ,O., & Pascual-Marqui, R.D. (2002). Classification and evaluation of the pharmacodynamics of psychotropic drugs by single-lead pharmaco-EEG, EEG mapping and tomography (LORETA). *Methods Find Exp Clin Pharmacol*, 24(Suppl. C), 97S–120S.
- Sanders, A.F. (1980). Stage analysis of reaction process. In G.E. Stelmach, and J. Requin (Eds.), *Tutorials in Motor Behavior* (pp. 331–354). Amsterdam: North Holland.
- Sanders, A.F. (1983). Towards a model of stress and human performance. *Acta Psychologica*, 53, 61-97.
- Sara, S.J. (2009). The locus coeruleus and noradrenergic modulation of cognition. *Nature Reviews Neuroscience*, 10, 211-223.
- Sara, S.J., Dyon-Laurent, C., & Hervé, A. (1995). Novelty seeking behavior in the rat is dependent upon the integrity of the noradrenergic system. *Brain Res Cogn Brain Res* 2, 181-7.
- Satterthwaite, T.D., Green, L., Myerson, J., Parker, J., Ramaratnam, M., Buckner, R.L. (2007). Dissociable but inter-related systems of cognitive control and reward during decision making: Evidence from pupillometry and event-related fMRI. *Neuroimage*, 37, 1017–1031.
- Schmidt, R.A, Gielen, S.C., and van den Heuvel, P.J. (1984). The locus of intersensory facilitation of reaction time. *Acta Psychologica*, 57, 145-164.
- Schmitt, J.A., Riedel, W.J., Vuurman, E.F., Kruizinga, M., & Ramaekers, J.G. (2002). Modulation of the critical flicker fusion effects of serotonin reuptake inhibitors by concomitant pupillary changes. *Psychopharmacology (Berl)*, 160, 381-386.
- Schröger, E. & Wolff, C. (1998). Behavioral and electrophysiological effects of task-irrelevant sound change: a new distraction paradigm. *Brain Research. Cognitive Brain Research*, 7, 71-87.
- Schwarz, W. (2001). The ex-Wald distribution as a descriptive model of response times. *Behavior Research Methods, Instruments, & Computers*, 33, 457-469.
- Seeley, W.W., Menon, V., Schatzberg, A.F., Keller, J., Glover, G.H., Kenna, H., Reiss, A.L., & Greicius, M.D. (2007). Dissociable intrinsic connectivity networks for salience processing and executive control. *J Neurosci*, 27, 2349-56.
- Seifried, T., Ulrich, R., Bausenhart, K.M., Rolke, B., & Osman, A. (2010). Temporal preparation decreases perceptual latency: Evidence from a clock paradigm. *Quarterly Journal of Experimental Psychology*, 63, 2432-51.
- Semba, J., & Takahashi, R. (1985). The effects of L-threo-dihydroxyphenylserine on norepinephrine metabolism in rat brain. *Psychiatry Res*, 15, 319-26.
- Servan-Schreiber, D., Printz, H., & Cohen, J.D. (1990). A network model of catecholamine effects: gain, signal-to-noise ratio, and behavior. *Science*, 249, 892-895.
- Seu, E., Lang, A., Rivera, R.J., & Jentsch, J.D. (2008). Inhibition of the norepinephrine transporter improves behavioral flexibility in rats and monkeys. *Psychopharmacology (Berl, Ger)*, 202, 505-519.
- Shapiro, K.L., Caldwell, J., & Sorensen, RE. (1997). Personal names and the attentional blink: a visual "cocktail party" effect. *J Exp Psychol Hum Percept Perform*, 23, 504-14.

- Shiffrin, R.M., Lee, M.D., Kim, W., & Wagenmakers, E.-J. (2008). A survey of model evaluation approaches with a tutorial on hierarchical Bayesian methods. *Cognitive Science*, 32, 1248-1284.
- Shohamy, D., & Adcock, RA. (2010). Dopamine and adaptive memory. *Trends Cogn Sci*, 14, 464-72.
- Siegle, G.J., Steinhauer, S.R., Stenger, V.A., Konecky, R., & Carter, C.S. (2003). Use of concurrent pupil dilation assessment to inform interpretation and analysis of fMRI data. *Neuroimage*, 20, 114-124.
- Siever, L.J., & Davis, K.L (1985). Overview: toward a dysregulation hypothesis of depression. *Am J Psychiatry*, 142, 1017-31.
- Skinbjerg, M., Seneca, N., Liow, J.S., Hong, J., Weinshenker, D., Pike, V.W., et al. (2010). Dopamine beta-hydroxylase-deficient mice have normal densities of D(2) dopamine receptors in the high-affinity state based on in vivo PET imaging and in vitro radioligand binding. *Synapse*, 64, 699-703.
- Smith, P.L., & Ratcliff, R. (2004). Psychology and neurobiology of simple decisions. *Trends in Neurosciences*, 27, 161-168.
- Smith, S.M. (2002). Fast robust automated brain extraction. *Hum Brain Mapp*, 17, 143-55.
- Smith, S.M., Jenkinson, M., Woolrich, M.W., Beckmann, C.F., Behrens, T.E., Johansen-Berg, H., et al. (2004). Advances in functional and structural MR image analysis and implementation as FSL. *Neuroimage*, 23 Suppl 1, S208-19.
- Smith, S.M., & Nichols, T.E. (2009). Threshold-free cluster enhancement: addressing problems of smoothing, threshold dependence and localisation in cluster inference. *Neuroimage*, 44, 83-98.
- Smith, S.A. & Smith, S.E. (1999). Bilateral Horner's syndrome: detection and occurrence. *J Neurol Neurosurg Psychiatry*, 66, 48-51.
- Smith, S.M., Zhang, Y., Jenkinson, M., Chen, J., Matthews, P.M., Federico, A., et al. (2002). Accurate, robust, and automated longitudinal and cross-sectional brain change analysis. *Neuroimage*, 17, 479-89.
- Sokolov, E.N. (1963). Perception and the Conditioned Reflex. Oxford: Pergamon Press.
- Spencer, K.M. & Coles, M.G. (1999). The lateralized readiness potential: relationship between human data and response activation in a connectionist model. *Psychophysiology*, 36, 364-370.
- Stafford, I.L. & Jacobs, B.L. (1990). Noradrenergic modulation of the masseteric reflex in behaving cats. *Journal of Neuroscience*, 10, 91-107.
- Stahl, J. & Rammsayer, T.H. (2005). Accessory stimulation in the time course of visuomotor information processing: Stimulus intensity effects on reaction time and response force. *Acta Psychologica*, 120, 1-18.
- Stanford, T.R., & Stein, B.E. (2007). Superadditivity in multisensory integration: putting the computation in context. *Neuroreport*, 18, 787-792.
- Steere, J.C. & Arnsten, A.F. (1997). The alpha-2A noradrenergic receptor agonist guanfacine improves visual object discrimination reversal performance in aged rhesus monkeys. *Behavioral Neuroscience*, 111, 883-891.
- Stein, B.E., London, N., Wilkinson, L.K., & Price, D.D. (1996). Enhancement of perceived visual intensity by auditory stimuli: A psychophysical analysis. *Journal of Cognitive Neuroscience*, 8, 497-506.
- Sternberg S. (1966). High-speed scanning in human memory. *Science*, 153, 652-4.
- Sternberg, S. (1969). Memory-scanning: mental processes revealed by reaction-time experiments.

- Strange, B.A. & Dolan, R.J. (2004). Beta-adrenergic modulation of emotional memory-evoked human amygdala and hippocampal responses. *Proc Natl Acad Sci USA*, 101, 11454-8.
- Strange, B.A., Hurlemann, R., & Dolan, R.J. (2003). An emotion-induced retrograde amnesia in humans is amygdala- and beta-adrenergic-dependent. *Proc Natl Acad Sci USA*, 100, 13626-31.
- Sutton, R.S., & Barto, A.G. (1998). Reinforcement learning: An introduction. Cambridge, MA: MIT Press.
- Sutton, S., Braren, M., Zubin, J., & John, E.R. (1965). Evoked-potential correlates of stimulus uncertainty. *Science*, 150, 1187-8.
- Sutton, R.S. (1990). Integrated architectures for learning, planning and reacting based on approximating dynamic programming. In *Proceedings of the Seventh International Conference on Machine Learning*, p. 216–224, San Mateo, CA: Morgan Kaufmann.
- Szabo, S.T., & Blier, P. (2001). Effect of the selective noradrenergic reuptake inhibitor reboxetine on the firing activity of noradrenaline and serotonin neurons. *Eur J Neurosci*, 13, 2077-2087.
- Tait, D.S., Brown, V.J., Farovik, A., Theobald, D.E., Dalley, J.W., & Robbins, T.W. (2007). Lesions of the dorsal noradrenergic bundle impair attentional set-shifting in the rat. *Eur J Neurosci*, 25, 3719-3724.
- Talsma, D., Mulckhuyse, M., Slagter, H.A., & Theeuwes, J. (2007). Faster, more intense! The relation between electrophysiological reflections of attentional orienting, sensory gain control, and speed of responding. *Brain Research*, 1178, 92-105.
- Tandonnet, C., Burle, B., Vidal, F., & Hasbroucq, T. (2003). The influence of time preparation on motor processes assessed by surface Laplacian estimation. *Clinical Neurophysiology*, 114, 2376-2384.
- Tandonnet, C., Burle, B., Vidal, F., & Hasbroucq, T. (2006). Knowing when to respond and the efficiency of the cortical motor command: a Laplacian ERP study. *Brain Research*, 1109, 158-163.
- Thomas, S.A., Marck, B.T., Palmiter, R.D., & Matsumoto, A.M. (1998). Restoration of norepinephrine and reversal of phenotypes in mice lacking dopamine beta-hydroxylase. *J Neurochem*, 70, 2468-76.
- Thomas, S.A., Matsumoto, A.M., & Palmiter, R.D. (1995). Noradrenaline is essential for mouse fetal development. *Nature*, 374, 643-6.
- Thomas, S.A., & Palmiter, R.D. (1997a). Disruption of the dopamine beta-hydroxylase gene in mice suggests roles for norepinephrine in motor function, learning, and memory. *Behav Neurosci*, 111, 579-89.
- Thomas, S.A., & Palmiter, R.D. (1997b). Impaired maternal behavior in mice lacking norepinephrine and epinephrine. *Cell*, 91, 583-92.
- Thompson, J.M., O'Callaghan, C.J., Kingwell, B.A., Lambert, G.W., Jennings, G.L., & Esler, M.D. (1995). Total norepinephrine spillover, muscle sympathetic nerve activity and heart-rate spectral analysis in a patient with dopamine beta-hydroxylase deficiency. *J Auton Nerv Syst*, 55, 198-206.
- Timmers, H.J., Deinum, J., Wevers, R.A., & Lenders, J.W. (2004). Congenital dopamine-beta-hydroxylase deficiency in humans. *Ann N Y Acad Sci*, 1018, 520-3.
- Triviño, M., Correa, A., Arnedo, M., & Lupiáñez, J. (2010). Temporal orienting deficit after prefrontal damage. *Brain*, 133, 1173-1185.
- Tse, W.S., & Bond, A.J. (2002). Difference in serotonergic and noradrenergic regulation of human social behaviours. *Psychopharmacology (Berl, Ger)*, 159, 216-221.

- Tulen, J.H., Man in 't Veld, A.J., Dzoljic, M.R., Mechelse, K., & Moleman, P. (1991). Sleeping with and without norepinephrine: effects of metoclopramide and D,L-threo-3,4-dihydroxyphenylserine on sleep in dopamine beta-hydroxylase deficiency. *Sleep*, 14, 32-8.
- Tulen, J.H., Man in't Veld, A.J., Mechelse, K., & Boomsma, F. (1990). Sleep patterns in congenital dopamine beta-hydroxylase deficiency. *J Neurol*, 237, 98-102.
- Twa, M.D., Bailey, M.D., Hayes, J., & Bullimore, M. (2004). Estimation of pupil size by digital photography. *J Cataract Refract Surg*, 30, 381-389.
- Ullsperger, M., Harsay, H.A., Wessel, J.R., & Ridderinkhof, K.R. (2010). Conscious perception of errors and its relation to the anterior insula. *Brain Struct Funct*, 214, 629-43.
- Usher, M., Cohen, J.D., Servan-Schreiber, D., Rajkowski, J., & Aston-Jones, G. (1999). The role of locus coeruleus in the regulation of cognitive performance. *Science*, 283, 549-554.
- Usher, M., & McClelland, J.L. (2001). The time course of perceptual choice: the leaky, competing accumulator model. *Psychological Review*, 108, 550-592.
- Usher, M., Cohen, J.D., Servan-Schreiber, D., Rajkowski, J., & Aston-Jones, G. (1999). The role of locus coeruleus in the regulation of cognitive performance. *Science*, 283, 549-554.
- Vallesi, A., McIntosh, A.R., & Stuss, D.T. (2009). Temporal preparation in aging: a functional MRI study. *Neuropsychologia*, 47, 2876-81.
- Valls-Solé, J., Solé, A., Valdeoriola, F., Muñoz, E., Gonzalez, L.E., & Tolosa, E.S. (1995). Reaction time and acoustic startle in normal human subjects. *Neuroscience Letters*, 195, 97-100.
- Van Boxtel, G.J., Geraats, L.H., Van den Berg-Lenssen, M.M., and Brunia, C.H. (1993). Detection of EMG onset in ERP research. *Psychophysiology*, 30, 405-412.
- Van der Burg, E., Olivers, C.N., Bronkhorst, A.W., & Theeuwes, J. (2008). Pip and pop: Non-spatial auditory signals improve spatial visual search. *Journal of Experimental Psychology: Human Perception and Performance*, 34, 1053-65.
- Van Steveninck, A.L., Cohen, A.F., & Ward, T. (1989). A microcomputer based system for recording and analysis of smooth pursuit and saccadic eye movements. *Br J Clin Pharmacol*, 27, 712-713.
- Van Steveninck, A.L., Gieschke, R., Schoemaker, H.C., Pieters, M.S., Kroon, J.M., Breimer, D.D., et al (1993). Pharmacodynamic interactions of diazepam and intravenous alcohol at pseudo steady state. *Psychopharmacology (Berl)*, 110, 471-478.
- Van Steveninck, A.L., Schoemaker, H.C., Pieters, M.S., Kroon, R., Breimer, D.D., & Cohen, A.F. (1991). A comparison of the sensitivities of adaptive tracking, eye movement analysis and visual analog lines to the effects of incremental doses of temazepam in healthy volunteers. *Clin Pharmacol Ther*, 50, 172-180.
- Van Steveninck, A.L., Van Berckel, B.N., Schoemaker, R.C., Breimer, D.D., Van Gerven, J.M., & Cohen, A.F. (1999). The sensitivity of pharmacodynamic tests for the central nervous system effects of drugs on the effects of sleep deprivation. *J Psychopharmacol*, 13, 10-17.
- Vandekerckhove, J., & Tuerlinckx, F. (2008). Diffusion model analysis with MATLAB: a DMAT primer. *Behavior Research Methods*, 40, 61-72.
- Vandekerckhove, J., & Tuerlinckx, F. (2007). Fitting the Ratcliff diffusion model to experimental data. *Psychonomic Bulletin & Review*, 16, 1011-1026.
- Vidal, F., Grapperon, J., Bonnet, M., & Hasbroucq, T. (2003). The nature of unilateral motor commands in between-hand choice tasks as revealed by surface Laplacian estimation. *Psychophysiology*, 40, 796-805.

- Voss, J.L., Gonsalves, B.D., Federmeier, K.D., Tranel, D., & Cohen, N.J. (2011). Hippocampal brain-network coordination during volitional exploratory behavior enhances learning. *Nat Neurosci*, 14, 115-20.
- Vroomen, J., & de Gelder, B. (2000). Sound enhances visual perception: cross-modal effects of auditory organization on vision. *Journal of Experimental Psychology: Human Perception and Performance*, 26, 1583-1590.
- Wagenmakers, E.-J., & Farrell, S. (2004). AIC model selection using Akaike weights. *Psychonomic Bulletin & Review*, 11, 192-196.
- Wagenmakers, E.-J., Ratcliff, R., Gomez, P., & McKoon, G. (2008). A diffusion model account of criterion shifts in the lexical decision task. *Journal of Memory and Language*, 58, 140-159.
- Wald, A. (1947). Sequential analysis. New York: Wiley.
- Wang, L.E., Fink, G.R., Dafotakis, M., & Grefkes, C. (2009). Noradrenergic stimulation and motor performance: differential effects of reboxetine on movement kinematics and visuomotor abilities in healthy human subjects. *Neuropsychologia*, 47, 1302-1312.
- Warren, C.M., Breuer, A.T., Kantner, J., Fiset, D., Blais, C., & Masson, M.E. (2009). Target-distractor interference in the attentional blink implicates the locus coeruleus-norepinephrine system. *Psychon Bull Rev*, 16, 1106-11.
- Watson, D., Clark, L.A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *J Pers Soc Psychol*, 54, 1063-70.
- Wechsler, D. (1997). *Wechsler Adult Intelligence Scale-III*. San Antonio, TX: The Psychological Corporation.
- Wetzel, R., Lee, M.D., & Wagenmakers, E.-J. (2010). Bayesian inference using WBDev: A tutorial for social scientists. *Behavior Research Methods*, 42, 884-897.
- Willemse, J.J., Ross, H.A., Jacobs, M.C., Lenders, J.W., Thien, T., Swinkels, L.M., & Benraad, T.J. (1995). Highly sensitive and specific HPLC with fluorometric detection for determination of plasma epinephrine and norepinephrine applied to kinetic studies in humans. *Clin Chem*, 41, 1455-60.
- Witte, E.A., & Marrocco, R.T. (1997). Alteration of brain noradrenergic activity in rhesus monkeys affects the alerting component of covert orienting. *Psychopharmacology*, 132, 315-323.
- Wittmann, B.C., Daw, N.D., Seymour, B., & Dolan, R.J. (2008). Striatal activity underlies novelty-based choice in humans. *Neuron*, 58, 967-73.
- Woolrich, M.W., Behrens, T.E., Beckmann, C.F., Jenkinson, M., & Smith, S.M. (2004). Multilevel linear modelling for fMRI group analysis using Bayesian inference. *Neuroimage* 21, 1732-47.
- Woolrich, M.W., Ripley, B.D., Brady, M., & Smith, S.M. (2001). Temporal autocorrelation in univariate linear modeling of fMRI data. *Neuroimage*, 14, 1370-86.
- Yamamoto, K., & Ozawa, N. (1989). Increased firing of locus coeruleus neurons associated with preparatory set in rats. *Neuroscience Letters*, 106, 112-118.
- Yerkes, R.M., & Dodson, J.D. (1908). The relation of strength of stimulus to rapidity of habit formation. *Journal of Comparative Neurology & Psychology*, 18, 459-482.
- Yu, A.J., & Dayan, P. (2005). Uncertainty, neuromodulation, and attention. *Neuron* 46, 681-692.
- Zeigenfuse, M.D., & Lee, M.D. (2010). A general latent assignment approach for modeling psychological contaminants. *Journal of Mathematical Psychology*, 54, 352-362.
- Zhang, W., Klimek, V., Farley, J.T., Zhu, M.Y., & Ordway, G.A. (1999). Alpha2C adrenoceptors inhibit adenylyl cyclase in mouse striatum: potential activation by dopamine. *J Pharmacol Exp Ther*, 289, 1286-92.

- Zhang, W.P., Ouyang, M., & Thomas, S.A. (2004). Potency of catecholamines and other L-tyrosine derivatives at the cloned mouse adrenergic receptors. *Neuropharmacology*, 47, 438-49.
- Zhang, Y., Brady, M., & Smith, S. (2001). Segmentation of brain MR images through a hidden Markov random field model and the expectation-maximization algorithm. *IEEE Trans Med Imaging*, 20, 45-57.
- Zhu, Y., Iba, M., Rajkowski, J., & Aston-Jones, G. (2004). Projection from the orbitofrontal cortex to the locus coeruleus in monkeys revealed by anterograde tracing. *Society for Neuroscience Abstracts*, 30, 211-213.