

## CV Sander Nieuwenhuis

### Personal data:

Name: Sander Tjalling Nieuwenhuis  
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### Education/Professional History:

1997 M.S. in Experimental Psychology, Rijksuniversiteit Groningen  
Thesis Title: The temporal dynamics of task switching  
Thesis Advisor: Ritske de Jong

1992-1996 Classical guitar studies at the Groningen Conservatory

01-06/1997 Visiting researcher, University of Cambridge,  
Department of Experimental Psychology (Stephen Monsell)

1997-2001 Ph.D. in Cognitive Neuroscience, University of Amsterdam  
Dissertation Title: Control failures, error processing, and cognitive aging  
Thesis Advisors: Richard Ridderinkhof, Maurits van der Molen & Albert Kok

2001-2002 Universitair Docent (Lecturer), University of Amsterdam

2002-2003 Postdoctoral Fellow, Princeton University  
Neuroscience of Cognitive Control Lab (Jonathan Cohen)

2003-2006 Postdoctoral Fellow, Vrije Universiteit Amsterdam  
Department of Cognitive Psychology

2006-2008 Assistant Professor, Leiden University  
Cognitive Psychology Unit

2009- Associate Professor, Leiden University  
Cognitive Psychology Unit

### Publications (*h*-index = 25):

Jepma, M., Wagenmakers, E.-J., & **Nieuwenhuis**, S. (in preparation). Temporal expectation and information processing: A model-based decomposition.

Jepma, M., Te Beek, E.T., Wagenmakers, E.-J., De Kam, M.L., Van Gerven, J.M., & **Nieuwenhuis**, S. (in preparation). The role of the noradrenergic system in the exploration-exploitation trade-off: a pharmacological study.

**Nieuwenhuis**, S., & de Kleijn, R. (submitted). Consciousness of targets during the attentional blink: A gradual or all-or-none dimension?

**Nieuwenhuis**, S., de Geus, E.J., & Aston-Jones, G. (submitted). The anatomical and functional relationship between the P3 and autonomic components of the orienting response.

Jepma, M., & **Nieuwenhuis**, S. (submitted). Pupil diameter predicts changes in the exploration-exploitation trade-off: Evidence for the adaptive gain theory of locus coeruleus function.

Colzato, L., Waszak, F., **Nieuwenhuis**, S., Posthuma, D., & Hommel, B. (submitted). The flexible mind is associated with the Catechol-O-methyltransferase (COMT) Val158Met polymorphism: Evidence for a role of dopamine in the control of task switching.

- Gilzenrat, M.S., **Nieuwenhuis** S., Jepma, M., & Cohen, J.D. (in press). Pupil diameter tracks changes in control state predicted by the adaptive gain theory of locus coeruleus function. *Cognitive, Affective, & Behavioral Neuroscience*.
- 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.
- Yeung, N. & **Nieuwenhuis**, S. (2009). Dissociating response conflict and error likelihood in anterior cingulate cortex. *Journal of Neuroscience*, 29, 14506-14510.
- Nieuwenhuis**, S., & de Rover, M. (in press; to appear in 2010). Event-related potentials. *Encyclopedia of Psychopharmacology*. Springer Verlag.
- Nieuwenhuis**, S., & Jepma, M. (in press; to appear in 2010). Investigating the role of the noradrenergic system in human cognition. In T. Robbins, M. Delgado, & E. Phelps (Eds.), *Decision making. Attention & Performance, Vol. XXIII*. Oxford: Oxford University Press.
- Slagter, H.A., Lutz A., Greischar, L.L., **Nieuwenhuis**, S., & Davidson R.J. (2009). Theta phase synchrony and conscious target perception: Impact of intensive mental training. *Journal of Cognitive Neuroscience*, 21, 1536-1549.
- 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.
- Keizer, A.W. , **Nieuwenhuis**, S., Colzato, L.S., Teeuwisse, W., Rombouts, S.A.R.B., & Hommel, B. (2008). When moving faces activate the house area: an fMRI study of object file retrieval. *Behavioral and Brain Functions*, 4:50.
- Nieuwenhuis**, S., Jepma, M., La Fors, S., & Olivers, C.N.L. (2008). The role of the magnocellular and parvocellular pathways in the attentional blink. *Brain and Cognition*, 68, 42-48.
- Colzato, L.S., Bajo, M.T., Van den Wildenberg, W., Paolieri, D., **Nieuwenhuis**, S., La Heij, W., & Hommel, B. (2008). How does bilingualism improve executive control? A comparison of active and reactive inhibition mechanisms. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 34, 302-312.
- Ridderinkhof, K.R., **Nieuwenhuis**, S., & Braver, T.S. (2007). Medial frontal cortex function: An introduction and overview. *Cognitive, Affective, & Behavioral Neuroscience*, 7, 261-265. (Introduction to Special Issue of *CABN*)
- Yeung, N., Ralph, J., & **Nieuwenhuis**, S. (2007). Drink alcohol and dim the lights: The impact of cognitive deficits on medial frontal cortex function. *Cognitive, Affective & Behavioral Neuroscience*, 7, 347-355.
- Nieuwenhuis**, S., Van Nieuwpoort, C., Veltman, D.J., & Drent, M.L. (2007). Effects of the noradrenergic agonist clonidine on temporal and spatial attention. *Psychopharmacology*, 193, 261-269.
- Nieuwenhuis**, S., Schweizer, T.S., Mars, R.B., Botvinick, M.M., & Hajcak, G. (2007). Error-likelihood prediction in the medial frontal cortex: A critical evaluation. *Cerebral Cortex*, 17, 1570-1581.
- Slagter, H.A., Lutz, A., Greischar, L.L., Francis, A.D., **Nieuwenhuis**, S., Davis, J., & Davidson, R.J. (2007). Mental training affects distribution of limited brain resources. *PLoS Biology*, 5, e138.
- Yeung, N., Bogacz, R., Holroyd, C.B., **Nieuwenhuis**, S., & Cohen, J.D. (2007). Theta phase-resetting and the error-related negativity. *Psychophysiology*, 44, 39-49.
- Hajcak, G., & **Nieuwenhuis**, S. (2006). Reappraisal modulates the electrocortical response to unpleasant pictures. *Cognitive, Affective & Behavioral Neuroscience*, 6, 291-297.
- Nieuwenhuis**, S., Stins, J.F., Posthuma, D., Polderman, T.J.C., Boomsma, D.I., & De Geus, E.J. (2006). Accounting for sequential trial effects in the flanker task: Conflict adaptation or associative priming? *Memory & Cognition*, 34, 1260-1272.

- Olivers, C.N.L., & **Nieuwenhuis**, S. (2006). The beneficial effects of additional task load and positive affect on the attentional blink. *Journal of Experimental Psychology: Human Perception and Performance*, *32*, 364-379.
- Donkers, F.C.L., **Nieuwenhuis**, S., & Van Boxtel, G.J.M. (2005). Medial frontal negativities to averted gains and losses in the absence of responding. *Cognitive Brain Research*, *25*, 777-787.
- Nieuwenhuis**, S., & Yeung, N. (2005). Neural mechanisms of attention and control: Losing our inhibitions? *Nature Neuroscience*, *8*, 1631-1633.
- Overbeek, T.J.M., **Nieuwenhuis**, S., & Ridderinkhof, K.R. (2005). Dissociable components of error processing: On the functional significance of the P<sub>E</sub> vis-à-vis the ERN/N<sub>E</sub>. *Journal of Psychophysiology*, *19*, 319-329.
- Mars, R.B., Coles, M.G.H., Grol, M.J., Holroyd, C.B., **Nieuwenhuis**, S., Hulstijn, W., & Toni, I. (2005). Neural dynamics of error processing in medial frontal cortex. *NeuroImage*, *28*, 1007-1013.
- Talsma, D., Slagter, H.A., **Nieuwenhuis**, S., Hage, J., & Kok, A. (2005). The orienting of visuospatial attention: An event-related brain potential study. *Cognitive Brain Research*, *25*, 117-129.
- Hajcak, G., **Nieuwenhuis**, S., Ridderinkhof, K.R., & Simons, R.F. (2005). Error-preceding brain activity: Robustness, temporal dynamics, and boundary conditions. *Biological Psychology*, *70*, 67-78.
- Nieuwenhuis**, S., Gilzenrat, M.S., Holmes, B.D., & Cohen, J.D. (2005). The role of the locus coeruleus in mediating the attentional blink: A neurocomputational theory. *Journal of Experimental Psychology: General*, *134*, 291-307.
- Nieuwenhuis**, S., Aston-Jones, G., & Cohen, J.D. (2005). Decision making, the P3, and the locus coeruleus-norepinephrine system. *Psychological Bulletin*, *131*, 510-532.
- Nieuwenhuis**, S., Slagter, H., Alting von Geusau, N., Heslenfeld, D.J., & Holroyd, C.B. (2005). Knowing good from bad: Differential activation of human cortical areas by positive and negative outcomes. *European Journal of Neuroscience*, *21*, 3161-3168.
- Nieuwenhuis**, S., Nielen, M., Mol, N., Hajcak, G., & Veltman, D. (2005). Performance monitoring in obsessive-compulsive disorder. *Psychiatry Research*, *134*, 111-122.
- Nieuwenhuis**, S., Heslenfeld, D.J., Alting von Geusau, N.J., Mars, R.B., Holroyd, C.B., & Yeung, N. (2005). Activity in human reward-sensitive brain areas is strongly context dependent. *NeuroImage*, *25*, 1302-1309.
- Olivers, C.N.L., & **Nieuwenhuis**, S. (2005). The beneficial effect of concurrent task-irrelevant mental activity on temporal attention. *Psychological Science*, *16*, 265-269.
- Nieuwenhuis**, S., Broerse, A., Nielen, M.M.A., & De Jong, R. (2004). A goal activation approach to the study of executive function: An application to antisaccade tasks. *Brain and Cognition*, *56*, 198-214.
- Ridderinkhof, K.R., Ullsperger, M., Crone, E.A., & **Nieuwenhuis**, S. (2004). The role of medial frontal cortex in cognitive control. *Science*, *306*, 443-447.
- Nieuwenhuis**, S., Holroyd C.B., Mol, N., & Coles, M.G.H. (2004). Reinforcement-related brain potentials from medial frontal cortex: Origins and functional significance. *Neuroscience & Biobehavioral Reviews*, *28*, 441-448.
- Holroyd, C.B., **Nieuwenhuis**, S., Mars, R.B., & Coles, M.G.H. (2004). Anterior cingulate cortex, selection for action, and error processing. In: *Cognitive Neuroscience of Attention* (ed. M.I. Posner), pp. 219-231. New York: Guilford Press.
- Nieuwenhuis**, S., Yeung, N., Holroyd, C.B., Schurger, A., & Cohen, J.D. (2004). Sensitivity of electrophysiological activity from medial frontal cortex to utilitarian and performance feedback. *Cerebral Cortex*, *14*, 741-747.

- Holroyd C.B. \*, **Nieuwenhuis, S. \***, Yeung, N., Nystrom, L.E., Mars, R.B., Coles, M.G.H., & Cohen, J.D. (2004). Dorsal anterior cingulate cortex shows fMRI response to internal and external error signals. *Nature Neuroscience*, 7, 497-498. (\* = shared first authors)
- Van der Veen, F.M., **Nieuwenhuis, S.**, Crone, E.A., & Van der Molen, M.W. (2004). Cardiac and electro-cortical responses to performance feedback reflect different aspects of feedback processing. In: *Errors, Conflicts and the Brain. Current Opinions on Performance Monitoring* (eds. M. Ullsperger & M. Falkenstein), pp. 63-70. Leipzig: MPI of Cognitive Neuroscience.
- Nieuwenhuis, S.**, Yeung, N., & Cohen, J.D. (2004). Stimulus modality, perceptual overlap, and the Go/NoGo N2. *Psychophysiology*, 41, 157-160.
- Holroyd, C.B., **Nieuwenhuis, S.**, Yeung, N., & Cohen, J.D. (2003). Errors in reward prediction are reflected in the event-related brain potential. *Neuroreport*, 14, 2481-2484.
- Ridderinkhof, K.R., **Nieuwenhuis, S.**, & Bashore, T.R. (2003). Errors are foreshadowed in brain potentials associated with action monitoring in cingulate cortex. *Neuroscience Letters*, 348, 1-4.
- Nieuwenhuis, S.**, Yeung, N., Van den Wildenberg, W. & Ridderinkhof, K.R. (2003). Electrophysiological correlates of anterior cingulate function in a Go/NoGo task: Effects of response conflict and trial-type frequency. *Cognitive, Affective & Behavioral Neuroscience*, 3, 17-26.
- Nieuwenhuis, S.**, Yeung, N., & Cohen, J.D. (2003). A computational simulation of electrophysiological markers of anterior cingulate activity in a Go/NoGo task. Technical Report 2003/1, Center for the Study of Brain, Mind, and Behavior, Princeton University.
- Holroyd, C.B., Coles, M.G.H., & **Nieuwenhuis, S.** (2002). Medial prefrontal cortex and error potentials. *Science*, 296, 1610-1611 (Letter).
- Nieuwenhuis, S.**, Ridderinkhof, K.R., Talsma, D., Coles, M.G.H., Holroyd, C.B., Kok, A., & Van der Molen (2002). A computational account of altered error processing in older age: Dopamine and the error-related negativity. *Cognitive, Affective & Behavioral Neuroscience*, 2, 19-36.
- Nieuwenhuis, S.**, & Monsell, S. (2002). Residual costs in task-switching: Testing the failure-to-engage hypothesis. *Psychonomic Bulletin & Review*, 9, 86-92.
- Nieuwenhuis, S.**, Ridderinkhof, K.R., Blom, J., Band, G.P.H., & Kok (2001). Error-related brain potentials are differentially related to awareness of response errors: Evidence from an antisaccade task. *Psychophysiology*, 38, 752-760.
- Nieuwenhuis, S.**, Ridderinkhof, K.R., De Jong, R., Kok, A., & Van der Molen, M.W. (2000). Inhibitory inefficiency and failures of intention activation: Age-related decline in the control of saccadic eye movements. *Psychology and Aging*, 15, 635-647.
- Lorist, M.M., Klein, M., **Nieuwenhuis, S.**, De Jong, R., Mulder, G., & Meijman, T.F. (2000). Mental fatigue and task control: Planning and preparation. *Psychophysiology*, 37, 614-625.

#### Dutch publications:

- Wagenmakers, E.J., & **Nieuwenhuis, S.** (2005). Damasio's error? De somatic marker hypothesen onder vuur. *Neuropraxis*, nr. 6, 165-169.
- Nieuwenhuis, S.** (2005). Foutdetectie in de menselijke hersenen. *Neuropraxis*, nr. 3, 59-63.
- Nieuwenhuis, S.** & Olsthoorn, N. (1999). *Stamboom van de Nederlandse Psychonomie* (poster).

#### Invited and Conference Presentations (selection)

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|---------|---|
| 01/2003 | Invited presentation at Brock University, St Catherine's, Canada.   |
| 04/2003 | International workshop "Performance Monitoring & Interference Control: Basic Issues & Individual Differences" in Amsterdam. |

07/2003	Workshop "Errors, Conflicts and the Brain. Current Opinions on Performance Monitoring" in Dortmund, Germany.
05/2004	International workshop "Unique and shared processing limitations in dual-task performance" in Leiden, the Netherlands.
12/2004	Invited presentation at the University of Ghent, Belgium.
01/2005	Invited presentation at the 2005 Carmel Meeting "Forty Years of P300" in St Petersburg, Florida.
03/2005	International workshop " Control in Attention and Action " in Amsterdam, the Netherlands.
09/2005	Annual Meeting of the Society for Psychophysiological Research (SPR) in Lisbon, Portugal.
06/2006	Young Scientist Award lecture at the 6 <sup>th</sup> European Conference of the Federation of European Psychophysiology Societies (FEPS) in Budapest, Hungary.
05/2008	Annual Cognition Lecture Wolfram Schultz at the KNAW in Amsterdam. How to investigate the role of neuromodulatory systems in human cognition? (supporting act)
07/2008	International symposium "Attention and Performance XXIII: Decision making" in Stowe, VT, USA.
05/2009	Invited presentation at the University of Magdeburg, Germany.
10/2009	Early Career Award lecture at the 49 <sup>th</sup> annual meeting of the Society for Psychophysiological Research (SPR) in Berlin, Germany.
12/2009	Invited presentation at the University of Trier, Germany.

#### Teaching:

1997-2001	Several practical courses in research- and writing skills, University of Amsterdam
2004-2006	Course "Attention" at the Vrije Universiteit Amsterdam (lecturing)
2005-2006	Course "Cognitive Neuroscience & Neuropsychology" at the Vrije Universiteit Amsterdam (development, coordination, lecturing)
2008-	Courses "Neuromodulation" and "Cognitive Neuroscience" at Leiden University (lecturing)
2009-	Course "Scientific Writing" at Leiden University (coordination, lecturing)

#### Supervision / postdocs

##### *Research assistants*

Nisan Mol (2003-2004)  
Niels Alting von Geusau (2004-2006)  
Sabrina La Fors (2006-2007)

##### *Graduate students*

Marieke Jepma (2006-current)  
Stephen Brown (2009-current)

##### *Postdocs*

Mischa de Rover (2008-current)

### Honors, Awards, and Grants

2002	NWO TALENT-stipendium (\$32,000)
2002	Winner A.F. Sanders Award for best research paper by EPOS graduate student
2003	NWO-VENI grant (€200,000)
2005	NWO-VIDI grant (€600,000)
2005	NWO-Cognitie netwerksubsidie (€10,000) and NWO-Fonds Internationalisering Sociale Wetenschappen (€7,500)
2006	Young Scientist Award from the Federation of European Psychophysiology Societies
2006	Beurs voor KNAW Akademie-Colloquium (€19,500)
2006	A.N.T. Young Scientist Award (international award for “exceptional advances in EEG/MEG research”)
2009	NWO-MaGW “Vrije Competitie” PhD grant (€218,000)
2009	Award for Distinguished Early Career Contributions to Psychophysiology from the Society for Psychophysiological Research (SPR)

### Reviewing and Editorships

1998-1999	Associate editor of quarterly journal of the Nederlandse Vereniging voor Psychonomie: “De Psychonoom”
1999	Editor of the “Stamboom van de Nederlandse Psychonomie” (PhD family tree of Dutch Experimental Psychology; with Nomi Olsthoorn)
2000 -	Reviewer for various professional journals: Acta Psychologica; Archives of General Psychiatry; Attention, Perception & Psychophysics; Behavioral and Brain Functions; Biological Psychiatry; Biological Psychology; Brain and Cognition; Cerebral Cortex; Cognition, Cognitive, Affective & Behavioral Neuroscience; Cognitive Brain Research; Cortex; Emotion; European Journal of Neuroscience; Experimental Brain Research; Human Brain Mapping; IEEE:Systems, Man, & Cybernetics; International Journal of Neuropsychopharmacology; International Journal of Psychophysiology; Journal of Cognitive Neuroscience; Journal of Experimental Psychology:General; Journal of Experimental Psychology:Human Perception and Performance; Journal of Neuroscience; Journal of Psychiatric Research; Journal of Psychophysiology; Memory & Cognition; Nature Neuroscience; NeuroImage; Neuropsychologia; Neuroscience & Biobehavioral Reviews; Neuroscience Letters; PLoS ONE; PNAS; Psychological Research; Psychological Science; Psychology and Aging; Psychonomic Bulletin & Review; Psychopharmacology; Psychophysiology; Quarterly Journal of Experimental Psychology; Schizophrenia Research; Trends in Cognitive Sciences; Vision Research
2004 - 2007	Action editor for Brain and Cognition

- 2007 Guest editor for special issue of *Cognitive, Affective & Behavioral Neuroscience* on medial frontal cortex function (with Richard Ridderinkhof and Todd Braver).
- 2005 - Reviewer for the National Science Foundation (USA), the Netherlands Organization of Scientific Research (NWO), Research into Ageing (UK)

Other Relevant Professional Experience:

- 2000-2001 Member of the onderwijscommissie of the Experimentele Psychologie Onderzoeksschool (EPOS)
- 2005 Co-organizer NVP Wintercongres in Egmond aan Zee
- 2006 Organizer International Workshop “Errors, Conflicts, and Rewards: The Role of Medial Frontal Cortex in Cognitive Control and Performance Monitoring” in Amsterdam
- 2007 Co-organizer International Symposium “Blinks of the mind: New insights in temporal attention and consciousness” in Amsterdam
- 2007- Member of the examencommissie, Dept of Psychology, Leiden
- 2008- Coordinator of the Research Master programme at the Dept of Psychology, Leiden
- 2008-2009 Leergang Bestuurlijke Vaardigheden, Universiteit Leiden
- 2009- Member of the beoordelingscommissie NWO-Veni 2009
- 2009- Executive Board, Leiden Institute for Brain and Cognition