This bibliographical sketch does not include the following issues:

- Abstracts
- Manuscripts in progress (6)
- Submitted manuscripts (4)
- Manuscripts to appear (5)
- (Co-) organization of symposia
- Invited lectures (> 3 each year during the past five years)
- Ordinary lectures at scientific meetings
- (Co-) organization special workshops
- Teaching courses at summer schools, special workshops, etc.
- Teaching regular courses (at both the undergraduate and graduate levels)
- Awards

State College, 2010

Peter C.M. Molenaar

Biographical Sketch

Name: Peter C.M. Molenaar

Title: Professor of Human Development and Family Studies

Date of Birth: August 18, 1946

Institution	Degree	Year	Field of Study
University of Utrecht	B.A.*	1972	Psychology
	B.A.	1976	Philosophical Logic
	M.A.*	1976	Mathematical Psychology
	M.A.*	1976	Psychophysiology
	Ph.D.	1981	Social Sciences

*cum laude

Professional Experience:

1970-1976 Research Assistant (part-time 0.4)
Department of Psychology, University of Utrecht

1976-1985 Assistant Professor of Psychology
Department of Psychology, University of Amsterdam

1985-1993 Associate Professor of Psychology
University of Amsterdam
Member of Faculty Council
Member of Faculty Board (1988-1992)

1993-1996 Professor of Developmental Psychology
University of Amsterdam
The Pennsylvania State University

1996-1998 Professor of Developmental Psychology
University of Amsterdam
Head of Department of Cognitive Developmental Psychology

1999-2001 Professor of Mathematical and Developmental Psychology
University of Amsterdam
Head of Methodology Department
Head of Department of Cognitive Developmental Psychology

2001-2005 Professor of Mathematical and Developmental Psychology
University of Amsterdam
Head of Methodology Department

2005- Professor of Human Development and Family Studies
The Pennsylvania State University

Mission

The general theme of my work concerns the application of mathematical theories to solve substantive psychological issues. Some more specific elaborations of this theme are:

1. Application of mathematical singularity theory (in particular catastrophe theory) to solve the longstanding debate about the reality of developmental stage transitions. This work (mathematical and stochastic modeling techniques, experimental designs and user-friendly software) has found wide acceptance and has been successfully applied in a series of ongoing research projects.

2. Application of nonlinear multivariate statistical signal analysis techniques to solve the problem of mapping theoretical models of cognitive information-processing onto dynamically interacting EEG/MEG neural sources embedded in spatio-temporally coherent backgrounds. Adaptation and extension of these techniques to connectivity mapping based on fMRI BOLD time series.

3. Application of mathematical-statistical ergodic theory to study the relationships between intra-individual (idiographic) analyses and inter-individual (nomothetic) analyses of psychological processes. Development of innovative statistical multivariate time series techniques for the analysis of intra-individual processes (e.g., dynamic factor analysis), which now are applied in several research centers throughout the world. I have proven, based on the classical ergodic theorems, that for nonstationary processes such as learning and developmental processes it is necessary to focus on intra-individual variation (person-specific time series analysis). This proof will lead to a major re-orientation of psychometrics (e.g., test theory) and psychological methodology, which until now have been largely focused on analyses of inter-individual variation.

4. Application of advanced multivariate analysis techniques in quantitative genetics and developmental psychology.

5. Application of adaptive resonance theory (ART neural networks) to study the effects of nonlinear epigenetical processes. Use of mathematical biological models of self-organization.

6. Application of engineering control techniques to optimally guide psychological and disease processes of individual subjects in real time. Real-time optimal treatment of individual patients with type 1 diabetes and asthma under normal living conditions.

Research Projects and Grants

ERP-ontogenesis and cognitive development (Dutch Organization of Scientific Research).
Principal investigator: Dr. P.C.M. Molenaar.
Co-investigators: Dr. M.W. van der Molen and Dr. A. Kok.
This research seeks to explore the relation between stage-wise cognitive development and changes in the morphology of event-related brain potentials (ERP's). Through extensive dipole modeling it is investigated whether age-related changes in ERP-morphology are related to qualitative topographic changes of the underlying neural generators.
Completed in 1992.

Age-related changes in the relation between heart rate and attention (Dutch Organization of Scientific Research).
Principal inverstigator: Dr. M.W. van der Molen.
Co-investigator: Dr. P.M.C. Molenaar.
Heart-rate and respiration is measured during the child's performance in selective and sustained attention tasks. The focus of this project is on how age-related changes in selective and sustained attention are mapped on three dimensions of vagally controlled heart rate responses: respiratory sinusarrhythmia, anticipatory cardiac deceleration, and cardiac cycle time effects.
Completed in 1992.

Age-related changes in the relation between ERP's and attention (Ph.D. project University of Amsterdam).
Supervisiors: Dr. P.C.M. Molenaar and Dr. M.W. van der Molen.
The EEG is measured in a sequential desigh during the child's performance of selective attention tasks. The focus of this project is on how age-related changes in selective attention are mapped on the various components of the event-related brain potentials (ERP).
Completed in 1991.

Behavior genetic modeling of developmental processes (Ph.D. project University of Amsterdam).
Supervisor: Dr.P.C.M. Molenaar.
The project entails the construction of generalized causal modeling techniques in order to investigate age-dependent changes in the effects of genetic and environmental factors on multivariate phenotypic measures. The modeling techniques include corrections for biasing effects such as assortative mating and linkage disequilibrium.
Completed in 1992.

The role of organic and environmental factors in cognitive regression of mental retardates (Ph.D. project University of Amsterdam).
Supervisors: Dr. L. Oppenheimer and Dr. P.C.M. Molenaar.
In a longitudinal study of stage-wise cognitive development of mental retardates, the possible neuropsychological or institutional determinants of structural regressions are investigated.
Completed in 1994.

Cognitive-energetic interactions: A neurometric approach (Fellowship of the Royal Dutch Academy of Sciences awarded to Dr. R.J.M. Somsen).
Collaborating investigators: Dr. P.C.M. Molenaar and Dr. M.W. van der Molen.
The project aims at developing a neurometric assessment procedure for deficits in cognitive-energetic interactions relating to dysfunctioning of the central and automonous nervous system in children.
Completed in 1992.

The statistical analysis of stage-wise development (Dutch Organization of Scientific Research).
Principal investigator: dr. P.C.M. Molenaar.
By means of techniques derived from nonlinear systems theory and catastrophe theory, a process analysis of stage transitions in cognitive development is being carried out with longitudinal data.
Completed in 1993.

Connectionism and stagewise cognitive development (Ph.D. project University of Amsterdam).
Supervisor: Dr.P.C.M. Molenaar.
In a large-scale simulation study of Adaptive Resonance Theory, a neural network model of cognitive development is constructed in which stagewise transitions emerge as the outcome of self-organisation. The neural network behavior is analyzed by means of Catastrophe Theory.
Completed in 1996.

Robust dipole modelling of cognitive ERP's in children (Ph.D. project University of Amsterdam).
Supervisor: Dr.P.C.M. Molenaar.
An adaptive multivariate signal analysis tool-box that accommodates increased latency jitter and amplitude variability, as commonly observed in children's ERP's, is constructed. New features include the use of improved nonlinear statistical techniques for dipole modelling and adaptive Woody filtering.
Completed in 1995.

Genetic and environmental influences on indices of neural functioning during early development (Dutch Organization of Scientific Research).
Principal investigator: Dr. J.F. Orlebeke
Co-investigators: Dr. D.I. Boomsma, Dr. P.C.M. Molenaar, Dr. J.C. Woestenburg
Longitudinal genetic signal analysis, based on Nunez' EEG wave model, of neurometric indices of electrocortical functioning and development. A large group of five years old MZ and DZ twins is repeatedly measured at consecutive years.
Completed in 1996.

Genetic and environmental influences on indices of neural functioning and cognitive development during adolescence (Ph.D. project Research Institute of Growth and Development).
Principal investigators: Dr. P.C.M. Molenaar, Dr. J.F. Orlebeke, Dr. D.I. Boomsma
Longitudinal genetic signal analysis of neurometric EEG and ERP indices of electrocortical functioning and development. A large group of adolescent MZ and DZ twins is repeatedly measured at consecutive years.

Completed in 1996.

Stochastic dynamics of stage transitions (Dutch Organization of Scientific Research).
Principal investigator: Dr. P.C.M. Molenaar
Construction of robust algorithms for the fit of latent catastrophe models to multivariate noisy panel and time series data. Elaboration of a theoretical stochastic differential equation system for stage transitions.
Completed in 1997.

Selection based on non-spatial visual stimulus attributes (Dutch Organization of Scientific Research).
Principal investigators: Dr. J.L. Kenemans, Dr. P.C.M. Molenaar, Dr. A. Kok
Dipole modeling of ERP sources according to van der Heijden's theory of selective attention.
Completed 1999.

Nonlinear dynamics of cognitive stage transitions (Fellowship of the Royal Dutch Academy of Sciences awarded to Dr. L.H.J. van der Maas).
Collaborating investigators: Dr. P.C.M. Molenaar, Dr. M.W. van der Molen
Application of catastrophe theory and neural network modeling to cognitive stagewise development.
Completed 1999.

Mathematical-psychological status of artificial neural networks (Ph.D. project University of Amsterdam).
Supervisors: Dr. P.C.M. Molenaar & Dr. M.W. van der Molen
Artificial neural networks are characterized by a global structure based on neurophysiology. This structural organization leads to the question how the learning behavior of such networks can be interpreted in terms of the functional, procedural concepts underlying cognitive psychology. In this research project this question will be addressed by reformulating both artificial neural networks and mathematical-psychological models of cognitive functioning as specific instances of dynamic state-space models. This provides a common formal representation that will allow to study the relationship concerned as assessed in simulation studies within a particular paradigm: implicit learning.
Completed 2002.

Ergodicity: The relationship between intra- and interindividual variation (Ph.D. project University of Amsterdam).
Supervisors: Dr. P.C.M. Molenaar & Dr. G.J. Mellenbergh
The issue of how the structure of intraindividual variation is related to the structure of interindividual variation is of central concern to various fields of research, including mathematical statistics, psychometrics, developmental theory, and psychology at large. This relationship will be investigated at three levels: formal (starting from the so-called ergodicity theorems), synergetic (subjecting multi-case time series to longitudinal analysis), and empirical. The investigation will be mainly restricted to comparisons of factor models for time series (intraindividual variation) and longitudinal data (interindividual variation). The results will be of three kinds: 1) specification of the effects of various forms of nonergodicity on longitudinal factor

analysis; 2) quantification of the bias in using interindividual structural models to predict intraindividual variation; and 3) the development of valid criteria to detect nonergodicity in (longitudinal) factor analysis.

Electromagnetic network analysis: analysis of cortical interactions (Fellowship of the Royal Dutch Academy of Sciences awarded to Dr. H.M. Huizenga).
Collaborating investigator: Dr, P.C.M. Molenaar
Application of equivalent dipole modeling and multivariate time series analysis to source estimation for multi-lead EEG registrations.

Modeling structural variation (Fellowship of the Royal Dutch Academy of Sciences awarded to Dr. C.V. Dolan).
Collaborating investigators: Dr. P.C.M. Molenaar; Dr. L.H.J. van der Maas
The focus is on sources of structural variation, i.e. variation that is attributable to qualitative differences between responses of a single subject, or between groups of subjects. The primary research aim of this project is to develop a general approach to the analysis of structural variation based on the modeling of finite mixture distributions. The ultimate aim is to reduce the gap between psychological theory (source of hypothesis) and statistical model (test of hypothesis).

Parameter estimation in nonlinear dynamical models (MAG postdoc project).
Principal investigators: Dr. P.C.M. Molenaar; Dr. Ir. P. Hartelman.
In this project a unified methodology is developed to fit arbitrary nonlinear dynamical models directly to time series data obtained with one or more cases under time-varying conditions. The basic tool is a combination of the extended Kalman filter embedded in the expectation-maximization algorithm, derived by means of the reference probability method.

Bifurcation analysis of neural network models of cognitive development (SGW postdoc project awarded to Dr. M.E.J. Raijmakers).
Collaborating investigators: Dr. P.C.M. Molenaar; Dr. H.J.L. van der Maas
Causal modeling of stage transitions by means of self-organization in artificial neural networks of human information processing.

Statistical EEG/MEG source analysis (MAG research program or "aandachtsgebied" directed by Dr. H.M. Huizenga & Dr. P.C.M. Molenaar).
Application of nonlinear multivariate statistical signal analysis techniques to improve the fidelity and robustness of the localization of neural sources underlying multilead scalp EEG and MEG potential field registrations

Genetic influences of individual developmental processes (PhD. Project MAG).
Supervisors: Dr. P.C.M. Molenaar & Dr. D.C. van den Boom.
Construction and application of time series analysis techniques for quantitative genetical applications at the level of single subjects.

Recursive estimation of time-varying parameters in dynamic factor models for nonstationary psychological time series (NSF 0852147). PI: Peter Molenaar.

(Co-)supervised dissertations

W. Immink (1986). Parameter estimation in Markov models and dynamic factor analysis.

W. Wijker (1991). ERP ontogenesis in childhood.

J.E.A. Stauder (1992). Event related brain potentials and cognitive development during childhood.

D.I. Boomsma (1992). Quantitative genetic analysis of cardiovascular risk factors in twins and their parents.

C.V. Dolan ((1992). Biometric decomposition of phenotypic means in human samples.

H.L.J. van der Maas (1993). Catastrophe analysis of stagewise cognitive development.

H.M. Huizenga (1995). The statistical approach to electromagnetic source localization in the brain.

M.E.J. Raijmakers (1996). Epigenesis in neural network models of cognitive development.

C.E.M. van Beijsterveldt (1996). The genetics of electrophysiological indices of brain activity.

P.A.I. Hartelman (1997). Stochastic catastrophe theory.

B.R.J. Jansen (2001). Development of reasoning on the balance scale task: Psychometric assessment of cognitive strategies.

I. Visser (2002). Rules and associations: Hidden Markov models and neural networks in the psychology of learning.

R.P.P.P. Grasman (2004). Sensor array signal processing and the neuro-electromagnetic inverse problem in functional connectivity analysis of the brain.

E.L. Hamaker (2004). Time series analysis and the individual as the unit of psychological research.

L.J. Waldorp (2004). Statistical model identification in electromagnetic source analysis.

P. Van Rijn (2008). Categorical time series in psychological measurement.

Special mention is made of the unique situation at the University of Amsterdam where several of my previous dissertation students (Conor Dolan, Maartje Raaijmakers, Hilde Huizenga, Brenda Jansen, Lourens Waldorp, and Raoul Grasman) all have fixed positions up to full professorship and constitute a distinct department, now headed by prof. dr. Han van der Maas.

Miscellaneous

- Co-founder of the SuperCenter for Methodology (University of Virginia, PennState University, University of Amsterdam).
- Co-founder of the annual Behavior Genetics Association Summer School in quantitative genetic modeling.
- Secretary of the Inter-University Research Institute "Growth and Development" (till 1993).
- Member of the board of the "Inter-University Research Institute for Psychometrics and Sociometrics" (till 2005).
- Fellow of the "Inter-University Research Institute EPOS" (till 2005).
- Fellow of the Inter-University Research Institute for "Neurosciences Amsterdam" (till 2005).
- Fellow of the School for Statistics of the University of Amsterdam (till 2005).
- Member of the "European Research Institute for Health and Gerontology".
- Member of the Society for Psychophysiological Research (till 1999).
- Member of the European Society for Mathematical Psychology (till 1999).
- Associate Editor of *Biological Psychology* (till 2001).
- Associate Editor of *Early Development & Parenting* (till 2001).
- Associate Editor of *New Ideas in Psychology* (till 2005).
- Associate Editor of *Journal of Mathematical Psychology* (till 2005).
- Associate Editor of *Integrative Psychological and Behavioral Science*.
- Co-founder of the *International Journal of Idiographic Science*.
- Consultant for the research program "Longitudinal Twin-Family Studies: Use and Abuse of Alcohol". (NIAAA grant AA 86 04).
- Consultant for the research program "Cognitive-Energetic Interactions: Cardiovascular Aspects". (NIHM grant 25-096-5591).
- Co-founder of Annual Workshop in Genetics of Non-linear Dynamic Systems (NIH grant 1246000376A1).
- Member advisory board Cognitive Science Center Amsterdam (till 2005).
- Standing board member of the Social Science Division of the Dutch Organization of Science (NWO) (till 2003). I served in numerous NWO committees preparing the reorganization of the NWO organizational structure, coordinating and performing the annual evaluation of research project proposals, performing the evaluation of ongoing projects (e.g., the national longitudinal dyslexia project), strategic preparation of new organizational targets, and coordinating the development of brain imaging facilities.
- Member Society of Multivariate Experimental Psychology.

Selected Publications

Koppelaar, H., & Molenaar, P.C.M. (1976). Remark on “Algorithm 486: Numerical inversion of Laplace inverse [D5]”. ACM Transactions on Mathematical Software, 2, 395-396.

Molenaar, P.C.M. (1985). A dynamic factor model for the analysis of multivariate time series. *Psychometrika*, *50*, 181-202.

Molenaar, P.C.M., & Oppenheimer, L. (1985). Dynamic models of development and the mechanistic-organismic controversy. *New Ideas in Psychology*, *3*, 233-242.

Molenaar, P.C.M. and van der Molen, M.W. (1985). Global models: A viable compromise between conteny specifity and ease of application on heart rate. In: J.F. Orlebeke, G. Mulder, and L.J.P. van Doornen (Eds.). *The psychophysiology of cardiac control: Models method and data*. New York: Plenum Press, 375-390.

Woestenburg, J.C. and Molenaar, P.C.M. (1985). On doubling the efficiency of fast Fourier transforms for ERP analysis in the frequency domain. In: F.J. Maarse, W.E.J. van den Bosch, E.A. Zuiderveen, and P. Wittenburg (Eds). *Computers in psychology*. Lisse: Swets and Zeitlinger, 183-188.

Boomsma, D.I. and Molenaar, P.C.M. (1986). Using LISREL to analyze genetic and environmental covariance structure. *Behavior Genetics*, *16*, 237-250.

Molenaar, P.C.M. (1986). Issues with a rule-sampling theory of conservation learning from a structuralist point of view. *Human Development, 29*, 137-144.

Molenaar, P.C.M. (1986). On the impossibility of acquiring more powerful structures: A neglected alternative. *Human Development*, *29*, 245-251.

Molenaar, P.C.M. and van der Molen, W.M. (1986). Steps to a formal analysis of the cognitive-energetic model of stress and human performance. *Acta Psychologica*, *62*, 237-261.

Boomsma, D.I. and Molenaar, P.C.M. (1987). The genetic analysis of repeated measures I: Simplex models. *Behavior Genetics*, *17*, 111-123.

Boomsma, D.I. and Molenaar, P.C.M. (1987). Constrained maximum likelihood analysis of familial resemblance of twins and their parents. *Acta Geneticae Medicae et Gemollolgiae*, *36*, 29-39.

Molenaar, P.C.M. (1987). Dynamic factor analysis in the frequency domain: Causal modeling of multivariate psychophysiological time series. *Multivariate Behavioral Research, 22*, 329-353.

Molenaar, P.C.M. (1987). Dynamic assessment and adaptive optimisation of the therapeutic process. *Behavioral Assessment*, *9*, 389-416.

Molenaar, P.C.M. and Boomsma, D.I. (1987). Application of nonlinear factor analysis to genotype-environment interaction. *Behavior Genetics*, *17*, 71-80.

Molenaar, P.C.M. and Boomsma, D.I. (1987). The genetic analysis of repeated measures II: The Karhunen-Loeve expansion. *Behavior Genetics*, *17*, 229-242.

Molenaar, P.C.M. and Boomsma, D.I. (1987). Spectral analysis of twin time series designs. *Acta Geneticae Medicae et Gemollologicae*, *36*, 51-59.

Molenaar, P.C.M. and Roelofs, J.W. (1987). The analysis of multiple habituation profiles of single trial evoked potentials. *Biological Psychology*, *24,* 1-21.

Molenaar, P.C.M., & De Gooijer, J.G.(1988). On the identification of the latent covariance structure in dynamic nonstationary factor models. In: M.G.H. Jansen, W.H. van Schuur, (eds.): *The many faces of multivariate analysis, vol 1*. Groningen: Society for Multivariate Analysis in the Behavioral Sciences.

Molenaar, P.C.M., van der Molen, M.W., and Kok, A. (1988). Neurometrics of cognitive development with dynamic topographic methods. In: F.J. Maarse, L.J.M. Mulder, W.P.B. Sjouw and A.E. Akkerman (Eds.), *Computers in Psychology*. Amsterdam/Lisse: Swets and Zeitlinger, 48-56.

Molenaar, P.C.M., van der Molen, M.W., Wijker, W. and Boomsma, D.I. (1988). Cardiovascular neurometrics of the hyperactive child. In: F.J. Maarse, L.J.M. Mulder, W.P.B. Sjouw and A.E. Akkerman (Eds.), *Computers in Psychology*. Amsterdam/Lisse: Swets and Zeitlinger, 23-29.

Boom, J. and Molenaar, P.C.M. (1989). A developmental model of hierarchical stage structure in objective moral judgements. *Developmental Review, 9,* 133-145.

Boomsma, D.I., Martin, N.G., & Molenaar, P.C.M.(1989).Factor and simplex models for repeated measures: Application to two psychomotor measures of alcohol sensitivity in twins. *Behavior Genetics, 19*, 1, 79-96.

Boomsma, D.I., Ven den Bree, M.B.M., Orlebeke, J.F., & Molenaar, P.C.M.(1989). Resemblances of parents and twins in sports participation and heart rate. *Behavior Genetics, 19*, 1, 123-142.

Dolan, C.V., Molenaar, P.C.M., & Boomsma, D.I.(1989). LISREL analysis of twin data with structured means. *Behavior Genetics, 19*, 1, 51-62.

Molenaar, P.C.M. (1989). Aspects of dynamic factor analysis. *Analysis of Statistical Information*.. Tokyo: The Institute of Statistical Mathematics, 183-199.

Wijker, W., Molenaar, P.C.M., & Van der Molen, M.W.(1989). Age-changes in scalp distribution of cognitive Event-Related potentials elicited in an Oddball task. *Journal of Psychophysiology, 3*, 179-189.

Stauder, J.E.A., Molenaar, P.C.M., & Van der Molen, M.W.(1989). Equivalent dipole modeling of topographic ERP-components: A developmental study. *Journal of Psychophysiology, 3 ,* 361-368.

Boomsma, D.I., Molenaar, P.C.M., & Orlebeke, J.F. (1990) Estimation of individual genetic and environmental factor scores. *Genetic Epidemiology,* 7, 1, 83-92.

Dolan, C.V. & Molenaar, P.C.M. (1990) The power method for computing the largest eigenvectors (principal components) of a dispersion matrix using minimal computer memory. *Psychophysiology*, *27*, 3, 360-361.

Fishbein, S., Molenaar, P.C.M., & Boomsma, D.I. (1990). Simultaneous genetic analysis of longitudinal means and covariance structure using the simplex model: Application to repeatedly measured weight in a sample of 164 female twins. *Acta Geneticae Medicae et Gemollolgiae*, *39*, 165-172.

Molenaar, P.C.M. (1990). Neural network simulation of a discrete model of continuous effects of irrelevant stimuli. *Acta Psychologica*, *74*, 237-258.

Molenaar, P.C.M., Boomsma, D.I., Neeleman, D., & Dolan, C.V. (1990). Using factor scores to detect G x E interactive origin of "pure" genetic or environmental factors obtained in genetic covariance structure analysis. *Genetic Epidemiology,* 7, 1, 93-100.

Oppenheimer, L., Warnars-Kleverlaan, N., & Molenaar, P.C.M. (1990). Children's conceptions of selfhood and others: self-other differentiation. In: L. Oppenheimer (Ed.), *The self-concept. European perspectives on its development, aspects, and applications*. Berlin: Springer-Verlag.

Someren, E.J.W. van, Mirmiran, M., Bos, N.P.A., Lamur, A., Kumar, A., & Molenaar, P.C.M. (1990). Quantitative analysis of eye movements during REM sleep in developing rats. *Developmental Psychobiology*, 21, 1, 55-61.

Van der Maas, H.L.J., Verschure, P.F.M.J., & Molenaar, P.C.M., (1990). A note on chaotic behavior in simpe neural networks. *Neural Networks*, 3, 119-122.

Dolan, C.V., Molenaar, P.C.M., & Boomsma, D.I. (1991). Simultaneous genetic analysis of longitudinal means and covariance structure in the simplex model using twin data. *Behavior Genetics, 21*, 1, 49-65.

Dolan, C.V., & Molenaar, P.C.M. (1991). A comparison of four methods of calculating standard errors of maximum-likelihood estimates in the analysis of covariance structure. *British Journal of Mathematical and Statistical Psychology*, *44*, 359-368.

Kennemans, J.L., Molenaar, P.C.M., Verbaten, M.N., & Slangen, J.L. (1991). Removal of the ocular artifact from the EEG: A comparison of time and frequency domain methods with simulated and real data. *Psychophysiology, 28*, 114-121.

Kenemans, J.L., Molenaar, P.C.M., & Verbaten, M.N. (1991). Models for the estimation and removal of artifacts in biological signals. In R. Weitkanut (Ed.), *Digital biosignal processing.* Amsterdam: Elsevier Biomedical, 213-250.

Molenaar, P.C.M., Boomsma, D.I., & Dolan, C.V. (1991). Genetic and environmental factors in a developmental perspective. In: Magnusson, D., Bergman, L.R., Rudinger, G., & Torestad, B. (Eds.), *Problems and methods in longitudinal research: Stability and change*. Cambridge: Cambridge University Press.

Somsen, R.J.M., Molenaar, P.C.M., van der Molen, M.W., & Jennings, J.R. (1991). Behavioral modulation patterns fit an animal model of vagus-cardiac pacemaker interactions. *Psychophysiology*, *28*, 383-399.

Stauder, J.E.A., Molenaar, P.C.M., & Van der Molen, M.W.(1991). Identification of equivalent dipole sources of Event Related Brain Potentials with only 14 EEG-channels. In L.J.M. Mulder, F.J. Maarse, W.P.B. Sjouw, & A.E. Akkermans (Eds.), *Computers in psychology: Applications in education research and psychodiagnostics*. Amsterdam: Swets & Zeitlinger, 124-131.

Weber, E.J.M., Molenaar, P.C.M., & Van der Molen, M.W. (1991). PSPAT: A program for spectral analysis of point events including a test for stationarity. In L.J.M. Mulder, F.J. Maarse, W.P.B. Sjouw, & A.E. Akkerman (Eds.), *Computers in psychology: Applications in education research and psychodiagnostics*. Amsterdam: Swets & Zeitlinger, 132-139.

Dolan, C.V., Molenaar, P.C.M., & Boomsma, D.I. (1992). Decomposition of multivariate phenotypic means in multigroup genetic covariance structure analysis. *Behavior Genetics*, *22*, 319-335.

Dolan, C.V., Wijker, W., & Molenaar, P.C.M. (1992). A note on the stability of eigenvectors (principal components) derived from ERP data. *Journal of Psychophysiology*, *6*, 65-70.

Molenaar, P.C.M. (1992). Longitudinal mean trends. In M.C. Neale & L.R. Cardon (Eds.), *Methodology for genetic studies of twins and families*. Dordrecht: Kluwer, 305-311.

Molenaar, P.C.M., de Gooijer, J.G., & Schmitz, B. (1992). Dynamic factor analysis of nonstationary multivariate time series. *Psychometrika*, *57*, 333-349.

Van der Maas, H.L.J., & Molenaar, P.C.M. (1992). Stagewise cognitive development: An application of catastrophe theory. *Psychological Review*, *99*, 395-417.

Weber, E.J.M., Molenaar, P.C.M., & van der Molen, M.W. (1992). A nonstationarity test for the spectral analysis of heart rate variability with an application to respiratory sinus arrhythmia. *Psychophysiology*, *29*, 55-65.

Weber, E.J.M., Molenaar, P.C.M., & van der Molen, M.W. (1992). On spectral analysis and nonstationarity: Why not use a test if one is available? *Psychophysiology, 29*, 73-75.

Beek, P.J., Hopkins, B., & Molenaar, P.C.M. (1993). Complex systems approaches to the development of action. In G.J.P. Savelsbergh (Ed.), *The development of coordination in infancy*. Amsterdam: North-Holland, 497-515.

Burgess, R.L., & Molenaar, P.C.M. (1993). Human behavioral biology: Commentary on Lerner and von Eye's Sociobiology and human development: Arguments and evidence. *Human Development, 36*, 45-54.

Dolan, C.V., & Molenaar, P.C.M. (1993). NONLIS: A Fortran program for multi-group covariance structure analysis with nonstandard constraints. In F.J. Maarse & K. Kattenpoel Oude Heerink (Eds.), *Computers in psychology: Tools for experimental and applied psychology, vol. 4*. Amsterdam: Swets & Zeitlinger.

Molenaar, P.C.M. (1993). Methods come before methodology. *Contemporary Psychology*, *38*, 737-738.

Molenaar, P.C.M. (1993). Some innovatory methodological aspects of longitudinal studies of health and aging. In J.F.J. Schroots (Ed.), *Aging, health and competence: The next generation of longitudinal research*. Amsterdam: Elsevier, 275-291.

Molenaar, P.C.M. (1993). Dynamic factor analysis of psychophysiological signals. In J.R. Jennings, P. Ackles, & M.G.H. Coles (Eds.), *Advances in Psycho-physiology, vol. 5*. London: Jessica Kingsley Publishers, 229-302.

Molenaar, P.C.M., Boomsma, D.I., & Dolan, C.V. (1993). A third source of developmental differences. *Behavior Genetics*, *23*, 519-524.

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