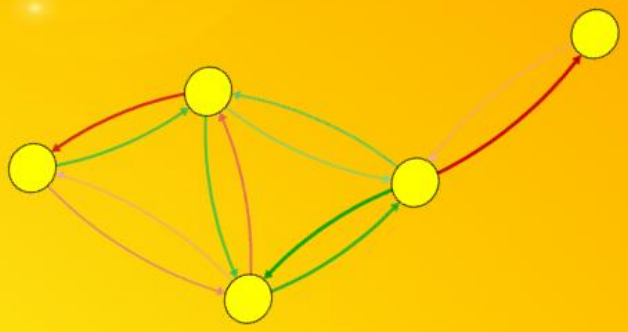
Psychological Networks & Time Series Models

Improving the analyses of complex clinical data



Het Kasteel, Groningen
Friday 14 September 2018

DENNY BORSBOOM CLAUDI BOCKTING EVA CEULEMANS

SACHA EPSKAMP ELLEN HAMAKER PETER DE JONGE PETER KUPPENS

WOLFGANG LUTZ RICHARD MCNALLY PETER MOLENAAR

TOM SNIJDERS MANUEL VOELKLE MARIEKE WICHERS

C.R. Rao Stichting

VVSOR

Psychological Networks & Time Series Models
Improving the analyses of complex clinical data

Organising Committee:
- Laura Bringmann, University of Groningen
- Casper Albers, University of Groningen
- Angélique Cramer, Tilburg University
- Pia Tao, University of Amsterdam

When discussing this meeting on social media, please use the hashtag
#GroningenNetworks

This meeting is made possible through sponsoring by
- The department of Psychology, University of Groningen
- The Social Sciences Section of the Netherlands Statistical Society VVS-OR
- The C. R. Rao Foundation, Groningen

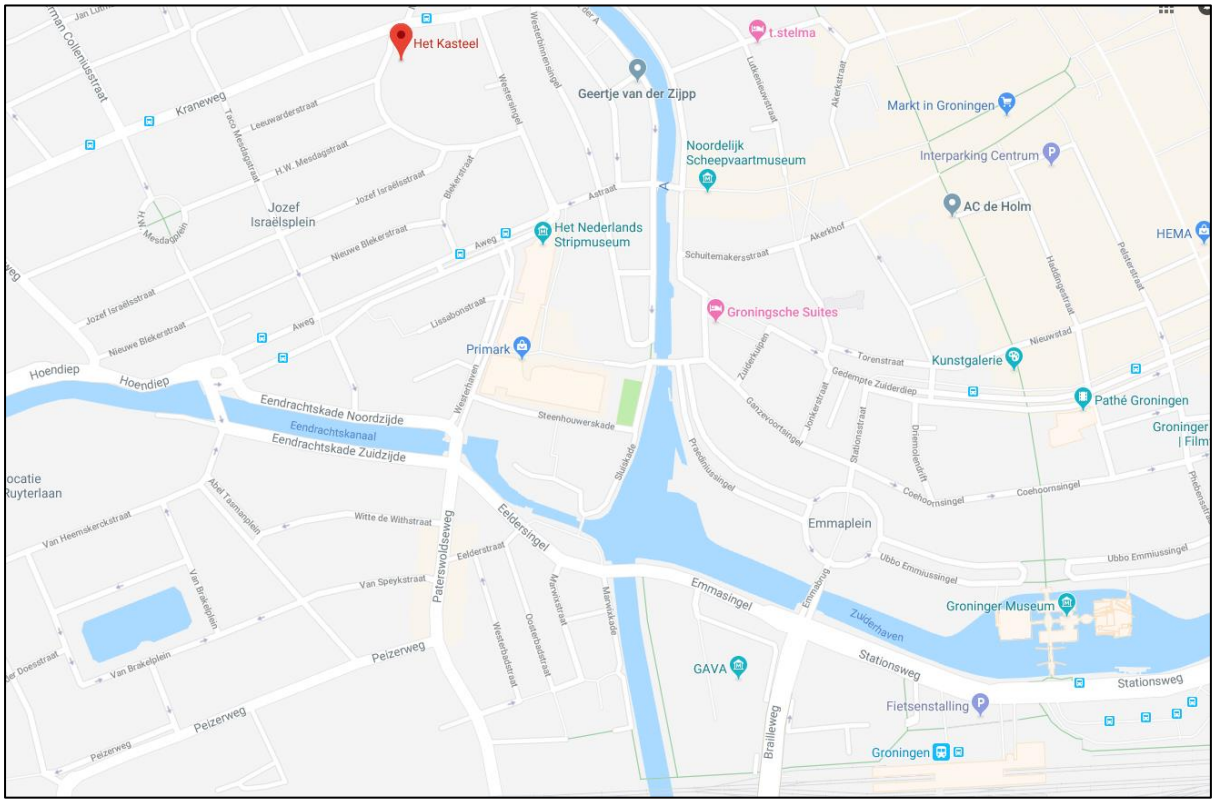
Meeting location

The meeting takes place at Het Kasteel in Groningen.
Address:

Melkweg 1
9718 EP Groningen

Getting there

The Melkweg is a 15-20 minute walk from the central train station in Groningen. You can take a bus from the train station, although this won't be much faster. Bus 8 (towards Europapark), exit Westerhaven; bus 9 (towards Paddepoel), exit Verlengde Visserstraat, and bus 7 (towards Vinkhuizen), exit Verlengde Visserstraat, all get you close to Het Kasteel.
If you arrive by car, you can park at Parkeergarage Westerhaven, which is a two minute walk from the venue, for € 1 per 20 minutes (maximum of € 19.50 for a full day). Parking at a Park & Ride at the edge of Groningen and continuing the trip by bus is considerably cheaper. Parking at the venue is restricted to those with an official *gehandicaptenparkeerkaart*.



Schedule of the day

09:30 Venue opens, coffee and tea
10:00 Opening by Laura Bringmann
10:05 Denny Borsboom

Session 1

The Possibilities and Inpossibilities of Cross-sectional and time-series (network) modelling

10:25 Opening by Angélique Cramer
10:30 Claudi Bockting
10:50 Sacha Epskamp
11:10 Richard McNally
11:30 Ellen Hamaker

Break, with lunch: 11:50 – 12:50

Session 2

Is the modelling of contemporaneous effects lagging behind?

12:50 Opening by Pia Tio
12:55 Peter Molenaar
13:15 Peter Kuppens
13:35 Wolfgang Lutz
13:55 Manuel Voelkle

Break, with drinks: 14:15 – 14:45

Session 3

Networks in psychopathology: more than pretty pictures

14:45 Opening by Casper Albers
14:50 Tom Snijders
15:10 Peter de Jonge
15:30 Eva Ceulemans
15:50 Marieke Wichers
16:10 Discussion by Klaas Sijtsma

Closing of the meeting, followed by drinks: 16:30 – 17:00

Titles and abstracts

Denny Borsboom (University of Amsterdam, The Netherlands)

Denny Borsboom will kick the event off with an overview of the state of the art of psychological networks and time series models.

Claudi Bockting (Academic Medical Center Amsterdam, The Netherlands)

Oversimplification or too complex?

One of the main research challenges is to understand the causal interplay between mental-, biological, stress related- and societal factors that can change over time characterized by large individual differences, in order to explore new targets for prevention and treatment for mental health conditions. Complexity modelling tools might generate new targets. In this presentation implications for tomorrows research and interventions will be discussed.

Sacha Epskamp (University of Amsterdam, The Netherlands)

No paradoxes: interpreting within- and between-subject network structures

Network models can be used to separate sources of (co)variance in contemporaneous, temporal and between-subjects networks, which may lead to seemingly paradoxical results. This talk will focus on (1) the interpretation of such different network models and apparent paradoxes, (2) the empirical correspondence between these different network models, and (3) the interpretation of network models based on cross-sectional data.

Richard McNally (Harvard University, USA)

Psychopathology Networks: Clinical Issues

Network analysis has captivated psychopathologists, especially those trained in cognitive-behavior therapy (CBT). My purpose is to explain why this has occurred. Focusing on cross-sectional networks, my talk has three parts. First, I discuss the curious marriage between biomedical neo-Kraepelinian psychiatrists and CBT clinicians, and how network analysis has triggered their impending divorce. Second, I underscore features of network analysis that resonate strongly with CBT clinicians. Third, I furnish examples from clinical studies, including those moving beyond pure symptom networks.

Ellen Hamaker (Utrecht University, The Netherlands)

Cross-sections, causality and consistency

In this talk I will begin by discussing the (im-)possibility of separating within-person processes from stable between-person differences in cross-sectional data. Then I will discuss causality from the counterfactual framework, and connect this to the within-between debate. I will end with emphasizing the importance of the concept of consistency for the field to make progress.

Peter Molenaar (The Pennsylvania State University, USA)

Using GIMME to estimate contemporaneous directed connections

After a quick introduction to the implications of ergodic theory for quantitative psychology I will present the GIMME program to analyze heterogeneous ensembles of replicated multivariate time series. It will be emphasized how directed contemporaneous paths among component time series can be reliably detected.

Peter Kuppens (University of Leuven, Belgium)

The role of contemporaneous effects in emotion research

In my talk I will discuss three examples where contemporaneous effects are important to consider for understanding the nature and (dys)regulation of emotions. First, pinpointing the nature and boundary conditions of contemporaneous response synchronization within an emotional episode remains a crucial challenge for understanding the nature and in fact the very definition of emotion. Second, the extent to which individuals respond with very specific versus rather broad positive or negative emotional experiences (e.g., emotion differentiation) is thought to be indicative of adaptive versus maladaptive emotional functioning. Third, the degree of bipolarity of positive and negative emotional states likewise reveals an important facet of an individual's emotion architecture and health.

Wolfgang Lutz (University of Trier, Germany)

The potential of contemporaneous and lagged models for personalized recommendations in psychological treatment

In this presentation, a computer based prediction, feedback and problem solving tool for clinical practice and its underlying research concepts will be presented. The focus will be on the development of different elements used for the prediction and tracking of personalized treatment recommendations based on cross-sectional and time series data. The inclusion of further measures and temporal dynamic (network) modeling (e.g. contemporaneous and lagged relations) to improve its potential for further research and clinical practice will be discussed.

Manuel Voelkle (University of Berlin, Germany)

Are contemporaneous effects lagging behind?

In the first part of this presentation, I will discuss contemporaneous and lagged effects from a theoretical, statistical, and practical perspective. In the second part of the presentation, I will introduce continuous time dynamic models and will discuss how paying close attention to the role of time may help to identify and understand causal mechanisms, underlying psychological functioning. In will end with discussing the potential and limitations of continuous time dynamic models for clinical research and practice.

Tom Snijders (University of Groningen, The Netherlands)

Some issues about *social* network modelling

It may be useful, also for psychologist who follow a network approach, to know something about the methodological backgrounds of network analysis in sociology and anthropology. This may help in understanding some of the idiosyncrasies of traditional network analysis (e.g., why is it only concerned with dichotomous tie variables?) and in hearing about developments that might still be useful. Issues to be discussed will include network delineation; network sampling; multivariate networks; the central role of indirect connections and of network dependence assumptions; positions; equivalence; the importance and difficulties of a process approach.

Peter de Jonge (University of Groningen, The Netherlands)

Will network models and time-series analyses result in understanding of the etiology of mental disorders?

The network approach to mental disorders represents a innovative approach to the etiology of mental disorders because it focuses on individual symptoms and their interactions over time. However, this approach is not without challenges and limitations. In this presentation I will present some problems that did not yet come to light in the past years that researchers have adopted this approach., and discuss the potential of the network approach in really understanding the etiology of mental disorders.

Eva Ceulemans (University of Leuven, Belgium)

How to handle the 'unique vs shared effects' complication when building VAR(1) based networks

In this talk I zoom in on the 'unique vs shared effects' complication. Focusing on VAR(1) based networks, I will introduce the problem and compare two approaches for handling it. The first approach is to impose a lasso penalty on the VAR(1) coefficients, setting some of them to zero. The second approach consists of reducing the variables to a few principal components, which are rotated towards simple structure, and applying a VAR(1) analysis to the rotated components.

Marieke Wichers (University Medical Center Groningen, The Netherlands)

The unruly nature of networks

In this presentation I will touch upon some aspects of debate in network research, such as: With what combination of variables can we validly construct networks? On what time-scale(s) do networks operate? What do results of network models used actually tell us? Can they inform therapy and how? Finally, I will discuss directions for future research.

Klaas Sijtsma (University of Tilburg, The Netherlands)
As discussant, Klaas Sijtsma will finish the day with a reflection on the talks.