38th IOPS
Summer Conference Tilburg

Tilburg, 8-9 June 2023

TILBURG ✦ UNIVERSITY

interuniversity graduate school of
iops Psychometrics and Sociometrics

Understanding Society

Conference Venue

8-9 June 2023
Tilburg University – Simon building
Prof. Cobbenhagenlaan 225
5037 DB Tilburg
Receipt: Simon Building - Pavilion
Presentations: Simon Building - SZ31

Accommodation

It is conference delegates' responsibility to make their own accommodation reservations. Here a list of hotels (in all categories) most of which close to the station or city center and conference venue.

Auberge Du Bonheur
Bredaseweg 441
5036 NA Tilburg
https://www.bonheurhorecagroep.nl/auberge-du-bonheur/nl/slapen

City Hotel
Heuvelring 128
5038 CL Tilburg
http://www.cityhoteltilburg.nl/

De Rooie Pannen (college hotel not for weekends)
Doctor Ahausstraat 1
5042 EK Tilburg
https://gastvrijderooipannentilburg.nl/slapen-in-tilburg/

IBIS
Dr Hub van Doorneweg 105
5026 RB Tilburg
https://www.ibis-tilburg.nl/

Mercure Hotel Tilburg Center
Heuvel 37
5038 CP Tilburg
https://mercure-tilburg.nl/

How to access Tilburg University

By Bus

See the information regarding bus transport on the website of Arriva. About every five minutes, a bus departs from the central bus station of Tilburg to the university. Each stop will be announced automatically and made visible in the bus.
A bus stop is located near Simon building at the conservatoriumlaan near Reitse Poort / Reitse toren

By Train

Information about train connections and delays is available at https://www.ns.nl/en. Leave the train at stop Tilburg University. The walking distance from Tilburg University station to Simon building is approximately 10 minutes.

By Car

From Breda, Eindhoven, and 's-Hertogenbosch

Take exit number 11 (Centrum West). At the traffic lights, follow direction Tilburg. For the east side of campus (Simon Building and Montesquieu Building), turn right at the Shell Station. Then take the second (first major) street on the left (Hogeschoollaan). Please note! Parking is limited on this side.

From Waalwijk, Kaatsheuvel and Loon op Zand

As you approach Tilburg from the North, follow the signs to "Centrum". At the roundabout, go straight ahead and follow the signs "Universiteit" from there on.

Where can I park my car?
Are you coming by car? Then you can park at the parking lots on the campus of Tilburg University. Please see link Where can I park my car? | Tilburg University

38th IOPS Summer Conference, 8-9 June 2023

Conference location: Tilburg University campus, Simon Building room SZ 31
Dinner: Tilburg University campus, Tilbury 3

Program Thursday 8 June (Room: SZ31)

10.30 - 11.00 **Receipt with coffee and tea (S8 pavilion)**

11.00 - 11.15 **Official opening** by Rob Meijer and welcome by local organizer Katrijn Van Deun

11.15 - 11.45 **Presentation Hongwei Zhao** (KU Leuven)
MixML-SEM: A parsimonious approach for finding clusters of groups with equivalent structural relations in presence of measurement non-invariance
Discussants: Andres Perez Alonso & Thom Volker

11.45 - 12.15 **Presentation Hidde Leplaa** (Utrecht University)
A qualitative evaluation of an (quasi)-experiment: Studying the effects of empathy-inducing probes on distancing during Covid to derive methodological guidelines
Discussants: Niels Vanhasbroeck & Hongwei Zhao

12.15 - 13.15 **Lunch**

13.15 - 13.45 **Presentation Ulrich Lösener** (Utrecht University)
Bayesian Sample Size Determination for Multilevel Models with Longitudinal Data
Discussants: Daan de Jong & Kenny Yu

13.45 - 14.15 **Presentation Danielle McCool** (Utrecht University)
Dynamic Time Warping-Based Imputation for long gaps in trajectory data
Discussants: Mehran Moazeni & Kenny Yu

14.15 - 14.30 **Break (S8 pavilion)**

14.30 - 15.00 **Presentation Maximilian Linde** (University of Groningen)
Bayes Factors in Cox Regression and the Quest for Priors
Discussants: Hidde Leplaa & Thom Volker

15.00 - 15.30 **Presentation Mehran Moazeni** (Utrecht University)
PRECISION-LVAD: A personalized algorithm to detect adverse events in advanced heart failure patients
Discussants: Daan de Jong & Lisette Sibbald

15.30 - 15.45 **Break (S8 pavilion)**

15.45 - 16.45 **Invited speaker Joris Mulder** (Tilburg University)
Understanding Social Network Dynamics using Relational Event Models

16.45 - 18.15 **Poster Session with short pitch and drinks (S8 pavilion)**
Ingrid Arts (Utrecht University)
How Far Does The Method of Web Probing Travel? Applying The Approach in India and the U.S.
Lennert Groot (University of Amsterdam)
Checking the Inventory: Illustrating Different Methods for Individual Participant Data Meta-Analytical Structural Equation Modeling
Kevin Kloos (Leiden University)
Continuous Sweep: a new parametric quantifier
Hanne Oberman (Utrecht University)
Visualization of incomplete and imputed data
Nikola Sekulovski (University of Amsterdam)
Testing Conditional Independence in Psychometric Networks: An Analysis of Three Bayesian Methods

18.30 **Conference dinner including "Best Paper Award 2022" (Tilbury 3)**

Best Poster & Oral Presentations
Voting forms for best presentations:
Best Poster Presentation
Best Oral Presentation

Program prior to the conference – Friday 9 June

10.00 - 11.00 **IOPS Board meeting (Simon building room: S4)**
10.30 - 11.00 **IOPS PhD student meeting (Simon building room: SZ31)**

Program Friday 9 June (Room: SZ31)

11.00 - 11.15   **Receipt with coffee and tea (S8 pavilion)**

11.15 - 11.45   **Presentation Niels Vanhasbroeck** (KU Leuven)
The Affective Ising Model: A nonlinear model of affect dynamics
Discussants: Ulrich Lösener & Mahdi Shafiee Kalamabad

11.45 - 12.15   **Presentation Giuseppe Arena** (Tilburg University)
How fast do we forget our past social interactions? Understanding memory retention with parametric decays in relational event models
Discussants: Ulrich Lösener & Lisette Sibbald

12.15 - 13.15   **Lunch (S8 Pavilion)**

13.15 - 13.45   **Prese**ntatio**n Zeynep Şiir Bilici** (University of Amsterdam)
Dependent effect sizes in MASEM: The current state of affairs
Discussants: Elise Dusseldorp & Hongwei Zao

13.45 - 14.15   **Presentation Kenny Yu** (KU Leuven)
Multiple pathways to widespread fears: Disentangling idiosyncratic fear generalization mechanisms using computational modeling
Discussants: Danielle McCool & Niels Vanhasbroeck

14.15 - 14.30   **Break (S8 pavilion)**

14.30 - 14.45   **Closing and Best Poster/Presentation Awards 2023**

Evaluation
In order to plan and improve our future conferences, we would like to ask for your feedback by filling out this Evaluation Form after the conference. Thank you so much.

Understanding Social Network Dynamics using Relational Event Models

Joris Mulder (Tilburg University)

In today's day and age, relational event history data are becoming increasingly available due to new technological developments. Communication software store information regarding who interacted with whom and when. Sociometric batches can be used to track the time and duration of face-to-face interactions between people in organizations, at conferences, or in schools. Military go in the fields with cameras and communication equipment that record military actions and interactions between team members. These rich data sources contain detailed information about the exact timing and order that relational events took place. The statistical analysis of such data allows us to get new insights about complex social interaction processes in communication science, criminology, sociology, psychology, and many more fields of research. The current talk discusses how the relational event model, the extension of the traditional event history (or survival) model to dyadic events between actors in a social network, can be used for this purpose. Moreover, extensions will be discussed (i) to fit large relational event models with many potentially important predictor variables using Bayesian regularization techniques, (ii) to analyze relational event data with multiple receivers using a multiplicative latent variable approach, and (iii) to build change-point relational event models by identifying instantaneous changes of the model parameters, e.g., when a network switches between different regimes.

MixML-SEM: A parsimonious approach for finding clusters of groups with equivalent structural relations in presence of measurement non-invariance

Hongwei Zhao (KU Leuven)

Structural equation modeling (SEM) is commonly used to explore relationships between latent variables, such as beliefs and attitudes. However, comparing structural relations across a large number of groups, such as countries, can be challenging. Existing SEM approaches may fall short, especially when measurement non-invariance is present. In this project, we propose Mixture Multilevel SEM (MixML-SEM), a novel approach to comparing relationships between latent variables across many groups that gathers groups with the same structural relations in a cluster, while accounting for measurement non-invariance in a parsimonious way. Specifically, MixML-SEM captures measurement non-invariance using multilevel CFA and then estimates the structural relations and mixture clustering of the groups by means of the structural-after-measurement (SAM) approach. In this way, MixML-SEM ensures that the clustering is focused on structural relations and unaffected by differences in measurement. MixML-SEM is particularly useful when sample sizes per group are too small to estimate partially group-specific measurement models (e.g., by multigroup CFA). In this case, accounting for measurement non-invariance with random parameters is more accurate and efficient. We demonstrate the effectiveness of MixML-SEM through simulations and a real data example, showing that it outperforms existing mixture SEM approaches.

Discussants: Andres Perez Alonso & Thom Volker

A qualitative evaluation of an (quasi)-experiment: Studying the effects of empathy-inducing probes on distancing during Covid to derive methodological guidelines

Hidde Leplaa (Utrecht University)

Experiments and quasi-experiments are almost invariably evaluated with quantitative methods. We argue that there can be added value of using qualitative methods to evaluate an experiment. In the context of a larger study, we explored and explained the methodological steps of the qualitative evaluation of a potential intervention effect. The study was conducted during the Covid-crisis, and investigated the effect of Empathy-inducing probes on the distance kept between people, measured by photographs taken at intervals. Within this context there was room to conduct our qualitative study. We focused on both actual behavior (referred to as strategies in our study) and intentions (motivations). We collected data using observations and two types of interviews. The analysis of the qualitative data was done following the constructivist approach to the Grounded theory. Our study provided guidelines for each step of a qualitative evaluation of an experiment: 1) the formulation of the research goals , 2) data collection, 3) data analysis, 4) interpretation of the intervention effect, and 5) ensuring the rigor of the research. We conclude that, by adding a qualitative analysis method to an (quasi-)experiment the ecological validity of a study can be enhanced, by acquiring a more holistic understanding of the phenomenon of interest.

Discussants: Niels Vanhasbroeck & Hongwei Zhao

Bayesian Sample Size Determination for Multilevel Models with Longitudinal Data

Ulrich Lösener (Utrecht University)

A priori sample size determination (SSD) is essential in designing trials in a cost-efficient manner and in avoiding underpowered or overpowered studies. Also, reporting a solid justification for a certain sample size forces the researcher to think about key aspects of their study such as hypotheses, design, and statistical model. Most often SSD is based on null hypothesis significance testing (NHST), an approach that has recently received severe criticism. As an alternative Bayesian evaluation of informative hypotheses has been developed. Informative hypotheses can be formulated based on researcher's theoretical and/or empirical expectations and can include order restrictions of multiple estimands. Bayes factors are used to quantify the relative support in the data for a certain informative hypothesis without suffering from some of the flaws in NHST. In this framework, SSD relies on simulations and has only been studied recently. Available software for this is limited to simpler models such as ANOVA and t-test, in which independence of observations is a crucial assumption. However, this assumption is rendered untenable when employing a longitudinal design where observations are nested within individuals. In that case a multilevel model should be used. This paper aims to provide researchers with a tool to perform SSD for multilevel models with longitudinal data in a Bayesian framework. To this end, we discuss the results of a simulation study for various realistic scenarios and introduce an open source R function that enables researchers to tailor the simulation to their specific situation.

Discussants: Daan de Jong & Kenny Yu

Dynamic Time Warping-Based Imputation for long gaps in trajectory data

Danielle McCool (Utrecht University)

Human mobility can be measured using the sensors on a participant's personal mobile device, alleviating many concerns of traditional surveys with new smart surveys. One primary issue with collecting this data (semi-)passively is the high percentage of missingness, much of which is an unavoidable consequence of device restrictions. The temporal nature of human mobility limits the avenues that researchers may take when they opt to aggregate the data. Without proper consideration of the missing data, computed statistics such as travel distance and number of stops will be biased. This paper compares multiple imputation, both with and without the use of Dynamic Time Warping for candidate selection, to linear interpolation, mean imputation and complete case analysis. The methods are applied to data generated by the 2018 Statistics Netherlands mobility study, and the impact of each method is investigated on various travel statistics. The choice of mechanism has a meaningful impact on the generation of mobility statistics, including distance traveled, time spent traveling, radius of gyration and average trip length. Mean imputation without respect to the time of day overestimates travel behavior when compared to household survey results. Under certain conditions, complete case analysis provides theoretically plausible results, but greatly reduces the total number of available cases, limiting breakouts along person or journey characteristics. Multiple imputation leads to increased trip length relative to linear interpolation and has the additional benefit of providing confidence intervals.

Discussants: Mehran Moazeni & Kenny Yu

Bayes Factors in Cox Regression and the Quest for Priors

Maximilian Linde (University of Groningen)

The use of Cox proportional hazards regression to analyze time-to-event data is ubiquitous in biomedical research. Typically, the frequentist framework is used to draw conclusions about whether hazards are different between the experimental and control conditions. We offer a procedure to calculate Bayes factors for simple Cox models, both for the scenario where the full data is available and the scenario where only summary statistics are available. The procedure is implemented in our "baymedr" R package. Furthermore, we suggest priors for Bayesian Cox regression for nine medical fields. The priors are informed by large corpora of already-existing studies within the respective medical fields.

Discussants: Hidde Leplaa & Thom Volker

PRECISION-LVAD: A personalized algorithm to detect adverse events in advanced heart failure patients

Mehran Moazeni (Utrecht University)

Advanced heart failure patients usually require a donor heart for destination therapy. However, since donor hearts are scarce, left ventricular assist devices (LVADs) have become a popular alternative. Unfortunately, patients often experience complications with this treatment. Telemonitoring LVAD parameters such as power (Watts) and flow (L/Min) may improve outcomes by detecting early signs of deterioration. To early detect signs of deterioration, we developed a personalized algorithm (PRECISION-LVAD) that can detect unscheduled admissions caused by common complications like cardiac arrhythmia and major bleeding. The algorithm uses patient-tailored thresholds to identify abnormal power and flow observations. It employs a linear mixed-effects (LME) model that considers pump parameters of a group of stable patients without any admission and the longitudinal data of each individual patient. This results in a personalized mean pump value that is flexible and reflects the patient's stable historical baseline. The patient-specific mean is then subtracted from real-time measurements to obtain residuals, which are smoothed with an exponentially weighted moving average (EWMA) statistical process control chart, and compared to upper and lower control limits determined by the EWMA. Our findings indicate that PRECISION-LVAD was capable of detecting 59% and 79% of cases related to CA and MB, with a low false alarm rate (FAR) of 2%. Although PRECISION-LVAD shows promise as a powerful tool for detecting CA and MB, some events were still not detected by the algorithm. Therefore, continuous refinement of the algorithm using data streams is necessary.

Discussants: Daan de Jong & Lisette Sibbald

The Affective Ising Model: A nonlinear model of affect dynamics

Niels Vanhasbroeck (KU Leuven)

Computational models are often used to formalize and study fluctuations of affect over time. A central question to the creation of such models is which characteristics a computational model should possess in order to adequately describe affect dynamics. In this regard, evidence for the presence of nonlinearity in affect dynamics accumulates. However, it is not yet clear where this nonlinearity comes from: It might either represent an inherent characteristic of affect or it might be an artifact due to environmental effects. In this talk, I will present the Affective Ising Model (AIM) – a nonlinear model of affect dynamics – and detail several studies in which we compared its viability against linear competitor models. By accounting for external events in these studies, we were able to investigate whether the observed nonlinearity in affect is indeed due to external events, or due to affect being nonlinear in nature. Results from each study indicate that the AIM outperforms its competitors, even when accounting for external events. This suggests that nonlinearity is a defining feature of affect and should, consequently, be accounted for in our analyses.

Discussants: Ulrich Lösener & Mahdi Shafiee Kalamabad

How fast do we forget our past social interactions? Understanding memory retention with parametric decays in relational event models

Giuseppe Arena (Tilburg University)

In relational event networks, endogenous statistics are used to summarize the past activity between actors. Such statistics, along with other available (exogenous) information, are then included in the relational event model in order to model the social interaction rate of the actors in the network. Typically, it is assumed that past events have equal weight on the social interaction rate in the (near) future regardless of the time that has transpired since observing them. Generally, it is unrealistic to assume that recently past events affect the current event rate to an equal degree as long-past events. Alternatively, one may consider using a prespecified decay function with a prespecified rate of decay. A problem then is that the chosen decay function could be misspecified yielding biased results and incorrect conclusions. In this work, we introduce three parametric weight decay functions (exponential, linear, and one-step) that can be embedded in a relational event model. A statistical method is presented to decide which memory decay function and memory parameter best fit the observed sequence of events. We also introduce a test for different memory models against each other using the Bayes factor. Finally, we apply the methodology to a relational event network of text messages sent among a group of university students.

Discussants: Ulrich Lösener & Lisette Sibbald

Dependent effect sizes in MASEM: The current state of affairs

Zeynep Şiir Bilici (University of Amsterdam)

The current meta-analytic structural equation modeling (MASEM) techniques cannot properly deal with cases where there are multiple effect sizes available for the same relationship from the same study. Existing applications either treat these effect sizes as independent, randomly select one effect size amongst many or create an average effect size. None of these approaches deal with the inherent dependency in effect sizes, and either leads to biased estimates or loss of information and power. An alternative technique is to use univariate three-level modeling in the two-stage approach to model these dependencies (Wilson et al., 2016). These different strategies for dealing with dependent effect sizes in the context of MASEM have not been previously compared in a simulation study. This study aims to compare these strategies to evaluate their performance before establishing new and better methods to tackle the problem of dependent effect sizes. We assessed the performance of these strategies across different conditions, varying the number of studies, number of dependent effect sizes within studies, sample size, the magnitude of the correlation between the dependent effect sizes and the between studies variance. We examine the relative bias in parameter estimates and standard errors, coverage proportions of confidence intervals, as well as mean standard error and power as measures of efficiency.

Discussants: Elise Dusseldorp & Hongwei Zhao

Multiple pathways to widespread fears: Disentangling idiosyncratic fear generalization mechanisms using computational modeling

Kenny Yu (KU Leuven)

Human generalization research aims to understand the processes underlying the transfer of prior experiences to new contexts. Generalization research predominantly relies on descriptive statistics, assumes a single generalization mechanism, interprets generalization from mono-source data, and disregards individual differences. Unfortunately, such an approach fails to disentangle various mechanisms underlying generalization behavior and can readily result in biased conclusions regarding generalization tendencies. Therefore, we combined a computational model with multi-source data to mechanistically investigate human generalization behavior. By simultaneously modeling learning, perceptual and generalization data at the individual level, we revealed meaningful variations in how different mechanisms contribute to generalization behavior. The current research suggests the need for revising the theoretical and analytic foundations in the field to shift the attention away from forecasting group-level generalization behavior and toward understanding how such phenomena emerge at the individual level. This opens the possibility of having a mechanism-specific differential diagnosis in generalization-related psychiatric disorders.

Discussants: Danielle McCool & Niels Vanhasbroeck