Network on Intrapersonal Research in Education (NIRE)

Seminar 5: Diaries and intensive longitudinal data in intervention designs

09th June 2016
9:30 to 16:00
University of Oxford

About NIRE

We live in a time when technology is part of our daily lives. The devices that we all use make it possible to collect in real-time vast amounts of data about ourselves. This opens up novel opportunities for individuals and organisations, particularly in the field of education: children using digital games for learning, students and teachers monitoring progress, researchers undertaking ambitious data collection. However, a coherent view of how we can use these technological advances and complex data sets to understand learning processes in real-time is yet to emerge. The seminar series aims to bring together experts, researchers and practitioners so we can:

- discuss the ways technology can be best utilised in research and practice
- promote the study of learning in real-time
- provide useful guidelines for collection of real-time data
- integrate real-time cognitions, emotions and behaviour into models of educational processes
- discuss appropriate statistical methods for analysing such data

Conveners

Lars-Erik Malmberg (University of Oxford, UK), Rebecca Eynon (University of Oxford, UK), Rob Klassen (University of York, UK), Katariina Salmela-Aro (University of Helsinki, Finland).

Program

09:30-10:00 Registration and refreshments

10:10–10:50 Franziska Perels (Saarland University, Germany): Self-monitoring to support self-regulated learning

Process models of self-regulated learning (e.g. Zimmerman, 2000; Pintich, 2000) emphasise self-monitoring as one important meta-cognitive component in the action phase. Therefore it is the aim of the contribution - based on first results of a meta-analysis - to present different interventions to foster self-regulated learning in school and university by explicitly promoting self-monitoring processes using standardised learning diaries. The results show that the promotion of self-monitoring leads to effects for both the learning processes and the academic achievement. Besides, using diaries in intervention studies provides the opportunity to analyse the training process as the daily measured variables can be used for time-series analyses. These analyses make it possible to reveal the effects of different training units or methods by using interrupted time-series analyses or trend analyses. Taking these different applications of self-monitoring into account advantages and disadvantages of this method in the context of the promotion of self-regulated learning will be discussed.
Although randomized control trials were once considered the only gold standard for causal designs, the Institute for Education Sciences and other medical research agencies have acknowledged difficulties with randomization in special education and personalized medicine settings. Single case designs are now acknowledged as acceptable designs to show causality. SCDs involve the repeated assessment of an outcome over time (i.e., a time series) within a case (which could be a child, a classroom, etc.), during one or more baseline phases and one or more treatment phases, where the experimenter controls the timing of the phases. In this talk I will introduce single case designs, analytical issues posed by SCD data such as small sample size and autocorrelations, and some commonly used analyses.

The inherent bias in the retrospective recall of mood states has long posed a challenge for clinical practice and psychiatric research. The development of smartphone technologies as well as the ubiquity of mobile networks has allowed a rapid expansion in prospective monitoring of a wide range of mood and physiological variables. These forms of monitoring can also serve as an intervention. They are well tolerated by participants and compliance is high. In this talk I will describe our experience of using self-reported outcome measures in the context of clinical trials as well as outline some early findings from the AMoSS study which seeks to understand the relationship between mood and other physiological variables using a range of wearable devices. I will explore the implications for designing studies in educational settings and how much of this data could be harvested with minimal burden to the participant.

The mobile diary is a diary research method which utilizes mobile phones as tools for data collection. Besides basic research, mobile diaries are increasingly used in various interventions for supporting self-monitoring and self-healing in daily life. In such interventions, text messages are sent to participants, for example to remind them about key activities and to help them keep the aims of the intervention in mind. In this presentation, I introduce a mobile diary we have developed and piloted for the purposes of family intervention and health promotion. The software developed for this method is a web program adapted for mobile devices, and it includes a package of interventive questions. The model supports the daily life of participants in the intervals between meetings with family counsellors/group sessions through the use of text messages. In our pilot studies, the text messages evoked reflection and reminded participants about important issues at home. Daily reporting of positive family interactions and key events seemed to be effective as tool for change. Mobile diaries are systematic, cost-effective and low-threshold tools for interventions, and therefore offer several possibilities for interventions in the school as well as family setting, for example by activating children in their daily life and mobilizing their personal resources. I also discuss the strengths, limitations and future possibilities of mobile diary-assisted interventions.

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Sometimes studies of daily experience include measurements at multiple time scales and other times researchers may wish to cascade inferences upwardly to higher level time units, such as days or weeks over momentary measurements. Simple averages of lower level time units result in high information loss in variances and trend information. At a minimum, researchers should be prepared to think through the risk and benefits of both collecting and analyzing data on multiple time scales. This talk reviews some recent advances in methodological theory around this need and also reviews a few short case studies of one way to tackle multiple time scales in the context of multilevel modeling.

**PLEASE NOTE THAT THEODORE’S TALK WILL BE LIVE STREAMED FROM THE USA**

**14:50–15:30 Florian Schmiedek (German Institute for International Educational Research): Experimental manipulation “in the wild”: Proposing a within-person encouragement design**

Experimentally manipulating treatment variables within persons across time allows investigating individual differences in the effects of behavioral interventions in everyday life contexts. When these interventions use behaviors as treatment that people can choose whether or not to show in their daily lives (like physical exercise), it would be desirable to randomly distribute treatment and control behaviors across occasions and prompt the according behavior using, for example, smartphone-based applications. Strict adherence to such prompts will often be unrealistic in real-life contexts, however. Therefore, I propose an encouragement design, in which participants agree to try to show the requested behavior when prompted – but can do otherwise if, for example, the behavior would not be appropriate in a given situation. If the prompt conditions are randomized and show a substantial correlation with the actual behavior, an instrumental variable approach can be used to estimate the causal effect of the behavior on outcome variables. If the design is implemented for a sample of participants, these models can be set up as two-level structural equation models, which allow investigating, for example, individual differences in treatment adherence and effectiveness of the intervention. Using simulations, the applicability of the approach under different conditions is explored. Potential applications and extensions as well as statistical assumptions and practical limitations of the approach are discussed.

**15:30-16:00 Discussion and wrap up**

**Registration details**

This ESRC-supported seminar is free to attend, but pre-registration is required. Lunch will be provided.

To book a place, please e-mail: nire@education.ox.ac.uk