New technologies to measure non-health topics in longitudinal studies

Date & time: 4 May 2017, 10:00 – 15:30
Venue: Room 728, UCL Institute of Education, 20 Bedford Way, London, WC1H 0AL
Wi-Fi Login: Eduroam or enter the code **IOE0405** to access the UCL Guest log in

Programme

9:30 Registration and coffee

10.00 Welcome (Michaela Benzeval, UKHLS)

10.10 Overview of the day (Annette Jäckle, UKHLS)

10.25 Active methods (Chaired by Jon Burton, UKHLS)

10.25	Millennium Cohort Study *(Lisa Calderwood (presenter), Emla Fitzsimons, and Emily Gilbert):* Design and implementation of a time use diary app in the Age 14 Survey of the Millennium Cohort Study
10.40	UK Household Longitudinal Study (Annette Jäckle): Participation in a mobile app survey to collect expenditure data: response rates and response biases
10.55	Panel 'Labour Market and Social Security' (Sebastian Bähr): Enriching an ongoing panel survey with mobile phone measures: The MoDeM study
11.10	IPSOS (Steven Ginnis): Mobile-based geo-triggered surveys: Experiences from the field
11.25	Discussion

11.45 Coffee

12.00 Passive methods to measure human interactions and the environment
(Chaired by Mai Stafford, MRC Unit for Lifelong Health and Ageing, UCL)

12.00	Avon Longitudinal Study of Parents and Children (Melanie Lewcock):Through babies' eyes: practical and theoretical considerations of using wearable technology to measure parent-infant behaviour from the mothers' and infants' view points
12.15	HomeSense (Kristrún Gunnarsdóttir): Using sensors to identify activity types and interactions in households
12.30	Avon Longitudinal Study of Parents and Children (Jez Zahra): Incorporating wearable air monitors into a research study of young children: reflections from parents and researchers

12.45 Discussion

13.05 Lunch

13.55 Passive methods GPS based (Chaired by Lisa Calderwood, Centre for Longitudinal, Studies, UCL)

13.55 Studying Physical Activity in Children's Environments across Scotland (Paul McCrorie): Integrating GPS technology into large scale, population level, data collections: practical utility for science, and concerns and considerations regarding its application in 10-11 year old children

14.10 NatCen Social Research (Alun Humphrey): A comparison of self-reported travel behaviour with GPS data: findings from an experiment on the National Travel Survey

14.25 Kantar Public (Helen Angle): When self-report is not enough - measuring unconscious behaviour change in response to a campaign designed to change where people brake at bends on country roads

14.40 Discussion

15.00 Key research needs (Mick Couper)

Discussion

15.30 Close

Abstracts

Design and implementation of a time use diary app in the Age 14 Survey of the Millennium Cohort Study

The Millennium Cohort Study (MCS) was the first large-scale longitudinal survey to use a mixed-mode approach for the collection of time use data among teenagers. A smartphone app, web diary, and paper diary were specifically designed for the sixth wave of the survey, when cohort members were aged 14. The smartphone app in particular was a departure from the more traditional methods of time use data collection, but proved to be a successful method for collecting this type of data from teenagers. This presentation will focus on the development of the time-use app, including its design, development and implementation in the field. We will report findings from the two pilot surveys, as well as initial findings from the main stage of the survey. We will also discuss take-up of different modes, data quality across modes, and methodological challenges faced.

Participation in a mobile app survey to collect expenditure data: response rates and response biases

We examine non-response error in expenditure data collected with a mobile app: 2,432 members of the *Understanding Society* Innovation Panel were invited to download an App to record all their spending on goods and services for a month, by scanning receipts or reporting spending in the app. We examine participation at different stages of the data collection, including the effects of an incentive experiment. We then examine biases in the types of sample members who participated, considering social-demographic characteristics, financial position and behaviours, mobile device ownership, usage patterns, self-rated skills and indicators of cooperativeness collected in prior panel waves.

Enriching an ongoing panel survey with mobile phone measures: The MoDeM study

The PASS panel survey is a major data source for labour market and poverty research in Germany with annual interviews since 2007. In autumn 2016, the supplemental study MoDeM (Mobile Device Measures) has been set up, in which selected respondents were asked to install a study app on their smartphones.

MoDeM combines short questionnaires that can be triggered by geographic location with passive data collection on a variety of measures (e.g. geographic location, app use). The triggering of questions allows us to enrich yearly retrospective data with data collected immediately after a certain event (e.g. placement officer visit). Passive data collection allows innovative measures, e.g. for social capital that complement traditional survey measures. Furthermore the additional smartphone measures create the potential to address new research questions related to the labour market and technology use (digital stress, home office performance). Finally, the study will provide new insights in the day structure and coping behaviour of unemployed persons and thus replicate aspects of the classic Marienthal case study with modern means.

In this presentation we will give an overview of the study. We will focus on data protection issues, implementation of the fieldwork, selectivity of participation in the study and of participation in short surveys under different incentive schemes. Furthermore, we will assess validity of the new measures compared to traditional survey measures.

Mobile-based geo-triggered surveys: Experiences from the field

Abstract: Steven and Sam will draw upon the experiences of implementing mobile-based geo-triggered surveys to explore their utility for social research, and possible application to longitudinal studies. Through three real-life case studies, across both the public and sector, this presentation will explore the benefits of taking a geo-triggering approach. In addition, Steven and Sam will discuss the success of implementation, challenges faced, and identify lessons for future studies.

Through babies' eyes: practical and theoretical considerations of using wearable technology to measure parent-infant behaviour from the mothers' and infants' view points

Aim: We will present the utility of first-person viewpoint cameras worn at home by mothers and infants to record behaviour. This approach aims to reduce problems associated with participant reactivity, which represent a fundamental bias in observational research. Methods: In an initial validation study with 14 mothers and infants, we compared footage recording the same play interactions from a traditional third-person point of view (3rd PC) and using small cameras worn on headbands (first-person cameras [1st PCs]) to record first-person points of view of mother and infant simultaneously. In addition, we left the dyads alone with the 1st PCs for several days to record natural mother-infant behaviour at home. Results: Codings of maternal behaviour from footage of the same scenario captured from 1st PCs and 3rd PCs showed high concordance (kappa >0.8). Footage captured by the 1st PCs also showed strong inter-rater reliability (kappa = 0.9). Data from 1st PCs during sessions recorded alone at home captured more 'negative' maternal behaviours per min than observations using 1st PCs whilst a researcher was present (mean difference = 0.90 (95% CI 0.5 to 1.2, $p < 0.001$ representing 1.5 SDs). Conclusion: 1st PCs offer many practical advantages and can reliably record maternal and infant behaviour. This approach may also record a higher frequency of less socially desirable maternal behaviours. It is unclear whether this difference is due to lack of need of the presence of researcher or the increased duration of recordings. This finding is potentially important for research questions aiming to capture more ecologically valid behaviours and reduce demand characteristics. Future: We are now piloting including the cameras in mothers and infants in the next generation of a large cohort study (ALSPAC-G2). We will present preliminary findings (n=19), which further demonstrate that this method captures more natural behaviours including negative emotion, but also 'baby talk' and imitation, which mothers may feel more comfortable displaying without a researcher present.

Using sensors to identify activity types and interactions in households

The HomeSense project is funded by the ESRC through the National Centre for Research Methods to explore the use of sensors for generating data of value to social science. The project is installing sensors in a small sample of households to measure trends and changes in temperature, humidity, particulate density, light, noise, objects/bodies coming in and out of range, electricity use and physical activity of persons. Data from these is sent over the internet to a central server for visualizations and analyses. The aim is to demonstrate the technology, catalogue the methodological and ethical issues that arise, explore the analytical tools needed to make inferences from the high volume, high frequency data streams the sensors generate, and provide guidelines for how social researchers can best use the sensors that are increasingly available as part of the growing 'internet of Things'. In this talk, we will review what we have learned since the project started in February 2016 and demonstrate examples of very fine grained views into private dwellings made possible using sensor technology.

Incorporating wearable air monitors into a research study of young children: reflections from parents and researchers

Air pollution constitutes a threat to human health at any stage of life, including before birth, and from short as well as long-term exposure. The emergence of small, wearable, and affordable objective air pollution monitoring devices provides unprecedented opportunity for the inclusion of personal air pollution monitoring into large population studies. However, it is important to evaluate data quality prior to the introduction of wearable devices in large scale studies; the aim of the current study is to assess the quality of data collected by personal wearable air monitors.

To establish the acceptability of the device we asked 30 parents that participate in the Children of the Children of the 90s study to wear the device for five days. These parents were asked to record their locations using an activity diary and to participate in a short telephone interview following participation.

Throughout the study there were multiple problems with the use of the wearable air monitors, from study set up through to data collection. While the devices were acceptable to participants, the drawbacks in the technology and the devices capacity to be used in research need to be addressed before the device can be used in large scale studies. The current presentation will discuss some of the issues surrounding the use of this portable monitor and provide some early interpretation of the qualitative data relating to acceptability.

Integrating GPS technology into large scale, population level, data collections: practical utility for science, and concerns and considerations regarding its application in 10-11 year old children.

The SPACES study (Studying Physical Activity in Children's Environments across Scotland) is a large-scale, nationwide, accelerometry and Geographic Positioning Systems (GPS) data collection involving children from across Scotland. GPS technology has advanced significantly over the last 10 years, and a number of studies investigating the environment/health relationship have considered its utility. This presentation will touch on the reasons why the use of GPS technology can advance scientific inquiry whilst revealing some of the concerns and considerations that may arise regarding its application (e.g. differential participant compliance).

The relationship between place and health is well established and it is widely recognised that the neighbourhoods in which we reside have significant implications for our health and health behaviours. GPS technology allows us to advance the scientific field by strengthening our understanding of 'actual' exposure to our local and wider environments. As such, we are now able to, more precisely, understand how people move through place, and evaluate acute context specific exposure to built and natural environmental risk factors/determinants of health (e.g. air pollution, tobacco/alcohol outlet, fast food availability, greenspace). This presentation will present some broad research questions that can be/are currently being investigated as a result of GPS integration.

The utility of GPS is not without its issues and problems. This presentation will also speak to a number of empirical examples that may, if not considered and addressed, result in data integrity

problems, and participant compliance/bias concerns. For example, our piloting highlighted issues with the physical delivery of study devices, with battery and memory components of the technology, ethical problems, data management, and processing difficulties. If using this this type of technology, researchers should be aware of the practical challenges and, where possible, integrate procedures that reduce their implications.

A comparison of self-reported travel behaviour with GPS data: findings from an experiment on the National Travel Survey

The National Travel Survey (NTS) collects information on individuals' travel behaviour using a combination of survey questions and a seven day travel diary. In 2011 the NTS included an experiment with GPS data collection. A randomly selected subsample of the main NTS sample (902 addresses) were allocated to the GPS treatment group. All respondents living at these addresses aged 12 and over were asked to carry a GPS device for a week commencing the day after the placement interview; no diaries or fuel and mileage charts were used in the pilot. An altered version of the placement and pick-up interview was used to collect additional information to inform the processing of GPS data and to collect other information that would usually be picked up in the travel diaries and fuel and mileage chart. Data from the GPS treatment group were compared with data from the main NTS for the same period. In this presentation we present findings from this experiment, looking at differences in response rates, estimates, distributions and patterns of travel behaviour between the two sources and reflecting on what we can learn from this experiment.

When self-report is not enough - measuring unconscious behaviour change in response to a campaign designed to change where people brake at bends on country roads

“If we can’t evaluate it, we are not running the campaign”. We will describe how we rose to the challenge of measuring automatic driving behaviour through an innovate solution integrating surveys, telematics and video to measure impact of a Department for Transport road safety campaign on drivers speed at bends. It raises the question about when self-reported behaviours are appropriate and what options are available when they are not.