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news on time use research in the
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New developments in time technology – projects, data, computing and services

SPENDING TIME ON MEDIA – RESULTS OF USING 'MULTITASKING FREQUENCY QUESTIONNAIRE' IN POLAND

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Media multitasking seems to be a part of modern lifestyles and could be interpret as a reaction to busy lives in which participants have multiple responsibilities and tasks to complete (Kenyon 2008). Nowadays, the increasing frequency of using the media is related to the growing availability of new technology. Over the last decade, the amount of time spent on the media by American adolescents (8-18 years old) increased by 20%, to about eight hours per day (Rideout et al. 2010). Despite the fact that the time devoted to media is growing rapidly, the time spent on multitasking is growing even faster. It turned out that in the same age group of American youth the propensity to use several media at the same time was up to 120 percent (Rideout et al. 2010). According to Dutch researchers, media multitasking is not only specific to young people (Voorveld & van der Goot 2013). Indeed, in the group of 13-16 years' people spent the largest amount of time using multiple media at once, but a group of 17-24 years spent less time in this way than those aged 50-65 years. As Rogers (2009) notes, this means that using the media has become a global phenomenon, more and more independent of different social variables such as age or place of living. One thing is certain: the media multitasking issue is brought up in many theoretical and research papers (Ophir et al. 2009, Wajcman 2015).

To understand how we can measure media multitasking, we should take a closer look at its definition. This term seems to be more specific than traditional multitasking in that it contains two aspects. Firstly, media multitasking concerns all types of switching from one medium to another (e.g. listening to the radio and watching television). Secondly, it also includes switching from one activity to another within the same medium (e.g. using Facebook and checking email while

browsing the web). Furthermore, it is hard to measure this phenomenon due to the diverse types of media. On one hand, there are traditional analog media, called 'old' media, like television, radio and press. On the other hand, the proliferation of new media is being observed, especially various activities on the Internet. The differences between them are significant - for instance, the use of traditional media is often limited in time and space (Kramarczyk & Osowiecka, 2014). In other words, if we want to watch our favourite show on TV, we should be in front of screen at a certain time, while process of communication by using Facebook or email can be done without temporal and spatial obstacles. Traditional media are also - as opposed to the 'new' – synchronous. This divergence, especially in the multiplicity of opportunities to access and share data in case of online media, suggests that the new media more could be more conducive to multitasking in comparison to the traditional ones.

The tendency to be a media multitasker is not the same for everyone who uses online tools or applications. Several additional factors are in play here. Based on research, Ophir, Nass and Wagner (2009) divided people into two groups: heavy multitaskers and light multitaskers - in terms of the amount of time which people spend on multitasking performance. The level of media multitasking depends on both individual and social variables. The propensity to media multitasking is correlated to impulsiveness (Sanbonmatsu et al. 2013), experience in media using (Brasel & Gips 2011), age, and sex (Todorov et al. 2014). Moreover, it is worth noting that this phenomenon is determined by cross-cultural context (Kopecky 2008, Kononova 2013).

From what has been said so far, it is pretty clear that there is a research need to measure time spending on multitasking, particularly on the Internet, also paying special attention to differentiation of multitasking skills. The most commonly used tool for measuring media multitasking is media-multitasking index, created by Ophir, Nass, Wagner (2009). This questionnaire lists twelve types of media, both traditional and new. It allows researchers to gather data concerning the amount of time spent on their usage per week. In addition, respondents are asked to quantify (on the Likert's scale) how often, while using one type of medium, they also use another kind of medium. Each rate, describing frequency of using, has different numeric value (e.g. 'always' = 1, 'sometimes' = 0,67), so that values can be easily added up for each medium. The index value represents the following formula[1]:

$$\text{MMI} = \sum_{i=1}^{11} \frac{m_i \times h_i}{h_{total}} \quad (1)$$

To measure media multitasking among Polish Internet users, we have decided to test multitasking frequency questionnaire, designed by Srivastava (2010). It contains twenty-four questions, including 14 items, regarding traditional media (e.g. newspapers, television, radio) and 10 statements relating to the Internet (e.g. Facebook, browsing websites, using email). The main

[1] m_i - sum of values concerning multitasking of each of 12 media, h_i – the number of hours devoted to the use of the medium, h_{total} - the number of hours spent on the use of all 12 types of media. The overall index is the sum of the results calculated by the following formula for all types of media.

idea was to ask respondents about frequency of using several media at the same time. The answers were ranked on the Likert's scale from 1 to 7 and the final results were obtained after summing all estimates. I have to add that in the first stage of tool adaptation all statements with instructions were translated into Polish and that 'back-translation' procedure was used afterwards. Next phase included developing an online questionnaire (by using QUALITRICS) with additional respondent's particulars, such as age, sex, place of living, and education.

In order to test the reliability of multitasking frequency questionnaire, it was made using Cronbach's alpha (α = 0,85). After selecting items relating to the use of traditional media and the Internet, reliability for traditional media was at α = 0.84, and in case of Internet and other various online applications at α = 0.82. The scale turned to be reliable.

The study was carried out in February 2015. There were 64 respondents, but only 45 people were qualified for the final analysis (*M* = 23,47; *SD* = 5,47), including 27 women and 18 men. Respondents were students (n = 29) and employees with different profiles of activity (n = 16). Nineteen people did not complete a full questionnaire - missing data accounted for over 50% of responses - therefore we omitted these results during further analyses.

The first important demographic variable was age. The results were statistically significant: t (43) = 2,048, p < 0,05. In group of women, the average number of points obtained on the scale of media multitasking was higher (*M* = 96,48; *SD* = 19,42) than among men (*M* = 85,22; *SD* = 15,77), which means that women use several media at the same time more often than men. It could be a very interesting conclusion, compared to other results, which show that men are better at media multitasking (Todorov et al., 2014). The analysis has also revealed a difference between women and men at the level of media multitasking when dividing it into traditional and 'online' media. Study has shown that women receive higher scores in media multitasking, taking into account the traditional media (*M* = 53,00; *SD* = 13,38) than men (*M* = 44,00; *SD* = 12,46) – t (43) = 2,271, p < 0,05. A similar analysis in the context of online media has shown no gender differences.

What is more, analysing the average number of points obtained in questions relating to combine activities in categories of traditional media and online media (using both types separately), subjects received on average a higher number of points on the scale of media multitasking regarding traditional media (*M* = 49,40; *SD* = 13,63) than new media (*M* = 42,58; *SD* = 9,89), as shown Student's t-test for dependent samples: t (44) = 3,11, p < 0,05.

Age of multitaskers turned out to be second significant variable. The results were compared in two age groups: up to 20 years old and in the group over 27 years. Analysis, by using Student's t-test, proved to be significant at the border of statistical trend: t (27) = 2,012, p = 0,054. People under 20 years old are more advanced in media multitasking (*M* = 98,29; *SD* = 21,77) than than those over 27 years (*M* = 84,73; *SD* = 13,91).

The ability to be a multitasker is recognized as an indicator of our times. This short note about multitasking among Polish Internet users provides good background for further research efforts.

It seems worthwhile to take into consideration different types of multitasking activities and their sequence depending on time budget. From the time - use perspective, it can also be significant in terms of other daily practices that younger people as well as women use several media simultaneously more often than older people and men.

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HARMONISING TIME USE MICRODATA FOR THE 2010 WAVE OF THE EUROPEAN TIME USE SURVEYS

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The Harmonised European Time Use Survey HETUS has been carried out twice, in 2000 and 2010. Around 20 countries participated in the survey at both occasions. Statistics Finland and Statistics Sweden prepared a harmonised database and a tabulation application based on the microdata from the 2000 wave with financing from the Statistical Office of the European Communities, Eurostat. The database contains 15 comparable countries: Belgium, Bulgaria, Estonia, Finland, France, Germany, Italy, Latvia, Lithuania, Norway, Poland, Slovenia, Spain, Sweden and the United Kingdom (www.tus.scb.se).

At the moment, Statistics Finland is harmonising the microdata from the second wave with financing from Eurostat. Nearly 20 countries are included. The data for the surveys were collected between 2008 and 2015. Statistics Finland instructs the participating countries to prepare three files from their data: an individual and household information file, a diary day file concerning background data, and an episode file concerning time use data. Statistics Finland checks the data and delivers harmonised files to Eurostat. The files are sent and received using Eurostat's eDAMIS system. Statistics Finland prepares a quality report concerning the database and compiles the metadata. The metadata are collected and published using with the European Statistical System Metadata Handler (ESS-MH) tool.

The harmonised data of the first country were completed in autumn 2014. So far, Statistics Finland has received data for harmonisation from nine countries, eight of which (Finland, Spain, France, Serbia, Romania, Italy, Estonia, Hungary) have already been sent to Eurostat. The project will continue until the end of 2016.

Eurostat will produce tables on time use for Eurostat's online database (http://ec.europa.eu/eurostat/data/database). The tabulation application maintained by Statistics Sweden concerning the 2000 wave will no longer be supplemented with the data of the 2010 wave.

GERMAN TIME USE SURVEY

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The third national Time Use Survey of the Federal Statistical Office since 2001/2002 and 1991/1992 is held in 2012/2013. This survey describes the time use structures of population groups and household types – in particular for topics related to policy on families, gender aspects and education. Also, the data collected have made it possible to construct a satellite sys-

tem of household production in parallel to the National Accounts. The Time Use Survey 2012/2013 will provide information in particular about the time spent on employment, household activities, child care, education and cultural activities, voluntary work, social engagement, the time use of children and shared time in housework and child care. According to the recommendations of the Stiglitz-Sen-Fitoussi report additional questions of the subjective feelings of time use, like lack of time and wishes to spend time were included in the survey. The data are collected using household and individual questionnaires and a time use diary. Each person of over 10 years of age fills in a diary for three days, i.e. two weekdays and one Saturday or Sunday. The sample consists of 5,000 households including 12,000 individuals. The total sample size is evenly distributed over 12 months. The field work started in August 2012 and will be finished at the end of July 2013. The design of the new survey is comparable with the design of 1991/92. At the same time, the methodological requirements set by Eurostat for European Time Use Surveys (HETUS) are included in order to facilitate comparison with other states. The time use survey is much desired by many users of the data at home and abroad, such as the German ministries, academia and researchers as well as other organizations and associations who require up-to-date results.

Introduction

The German Time Use Survey 2012/2013 (German TUS) is the third one of its kind in Germany. In the process about 12,000 participants from the age of ten keep diaries, describing for three days each of their activities which take longer than ten minutes. Furthermore these participants have to answer questions about employment, voluntary work, use of care facilities, out-of-school activities of children and culture activities as well as questions about subjective feelings. The goal of the survey is to generate data including information about families' workload and division of labour, child care as well as social engagement of all generations, different life situations of women and men as well as the time use of children and young persons. The time use data also provide information that takes the recommendations of the Stiglitz Commission (2009) into account, which suggest including into national accounts unpaid work of households as a basis of informative economic indicators. Measuring subjective well-being is a main topic of the Stiglitz Commission as well. Interrogating subjective evaluations of personal activities is one possibility to estimate the well-being of different population groups.

Shortly after the German reunification the first German time use survey was conducted in 1991/1992 including 7,200 households from different population groups. The goal was to help answering questions, particularly from topics of women and family policy, and to provide data for the satellite system of household production.

In 2001/2002 the Federal Statistical Office conducted the second time use survey (for further information about the two previous time use surveys in Germany see Merz and Ehling (1999) or Ehling et al. (2001)), taking into account that this survey had to be comparable with the previous survey and with time use surveys of other countries. Before the field work started, in particular for financial reasons, survey instruments had been developed which replaced the direct

questioning by interviewers as used in the first survey. As a consequence a method including two questionnaires – household questionnaire and personal questionnaire – and a diary was designed.

The concept of the current German TUS is based on the surveys of 2001/2002 and 1991/1992 and takes into account the international requirements in line with the HETUS guidelines (Harmonised European Time Use Surveys, Eurostat 2008). During a time period of 12 months (August 2012 – July 2013) about 5,000 households and about 12,000 persons will be questioned on a voluntary basis. Each person in the household, aged 10 years and older, is requested to fill in the individual questionnaire and the diary for three days. The activities will be recorded in an activity list.

The time use survey 2012/2013 in combination with the two preceding surveys shall contribute to picture trends of the time use of German households over a period of 20 years.

This paper presents the methods used for the current German Time Use Survey, describes the survey design and furthermore gives an insight into how the requirements of the Stiglitz-Sen-Fitoussi Commission (Stiglitz et al. 2009) are implemented in the content of the survey.

Method of the German Time Use Survey 2012/2013

Sampling design

The sampling of the German TUS 2012/2013 is based on quota sampling. The allocation of the quotas is based on data taken from the German microcensus for which citizens are legally obliged to give information. For quotation the characteristics of Land (federal state), household type (one-person households, couples without children, single parents, couples with children and not more than one parent employed, couples with children and both parents employed) and social status of the household member with the highest income (self-employed, public officials, salaried employees, wage earners, pensioners, other persons not engaged in economic activity) were used. Households that already participated in other household surveys were recruited according to the given quotas. In this process about a third of the households are taken from an access panel. This panel includes all households who, after the last microcensus, voluntarily agreed to participate in surveys of official statistics. In addition to the allocation to quota cells, given through the three characteristics, the sample was allocated into rural and urban areas using a classification of four municipality size classes. However, the results of this classification are not quotas but target values which should be reached as closely as possible in the sample.

The total sample size is evenly distributed over the whole 12-month period to avoid seasonal effects and also over all 365 days to cover all activities.

For estimation in the German TUS, a calibration method (Generalised Regression Method) will be applied. The same weight will be used for all individuals in the household. The calibration weights increase the accuracy of estimates, giving consistent estimates according to the variables that are included in the calibration method. The demographic variables, e. g. sex, age

groups, level of education and employment status (working full-time or part-time, non-working), will be used as calibration variables.

A second weight will be used for the diaries in order to include non-response adjustment for missing diaries or days. The diary weight depends on the number of days an individual keeps a diary. By using calibration techniques, the diary weight will include seasonal correction where response rates and postponing have changed weekly or daily sample sizes.

Survey design

All participating households receive a household questionnaire at least two weeks before the beginning of their specific questioning period and each household member from the age of ten gets a personal questionnaire as well as a diary.

The household questionnaire includes 24 questions referring to household composition, housing situation, household net income, received assistance and the use of day care facilities for children under the age of ten.

The personal questionnaire has to be filled in by each household member from the age of ten. They answer about 40 questions referring to their labour force participation, their level of education or training, their use of school and out-of-school learning opportunities, their cultural activities and their voluntary engagement as well as questions about their subjective time perception.

Again the diary, which covers a total of 72 hours, is the core tool of the survey 2012/2013. Each person from the age of ten describes in his/her own words all performed activities, applying ten-minute cycles. The division into ten-minute intervals is consistent with the guidelines for Harmonised European Time Use Surveys (HETUS Guidelines 2008). Instructions and examples referring to the correct description of the activities are given in the diary. Besides the main activity there can be entered a secondary activity and the participants have to choose which secondary activity is their first one. Furthermore they have to describe with whom the time was spent during the activity and which means of transport was used for journeys that took longer than 10 minutes.

The activities described in the diaries will be structured in an activity coding list covering 200 different activities. The coding list is based on the Eurostat recommendation (HETUS Guidelines 2008) and the list of the previous survey in order to make surveys more consistent and comparable, i.e. internationally on the cross-sectional level and nationally on the longitudinal level. The activity list keeps the main structure of the classification and generally the same categories. The changes introduced in the new activity coding list take into account rare frequencies (combined with other codes) and new policy needs, for example, the division of the school subjects.

At the end of each day the participants are asked for additional information on their diaries, for example, when they filled out their diary exactly, whether the described days were usual or ra-

ther unusual days or if they did a longer travel during the diary day, and there are questions about the subjective time perception, too.

Short versions of the household and the personal questionnaires as well as the diary were tested in a qualitative pretest including 16 cognitive interviews.

Content issues of the German Time Use Survey 2012/2013 referring to the Stiglitz Report

One of the demands of the Stiglitz-Sen-Fitoussi Commission in 2009 was to record data that provide information about the society's quality of life and wealth and thereby to complete traditional national accounts. Also, in its guidelines that will be published soon, the UNECE (United Nations Economic Commission for Europe) Task Force on Time Use Surveys suggests that methods should be applied in time use surveys that can help answering that kind of questions.

The current time use survey in Germany tries to meet part of these demands. Hence there are questions in the personal questionnaire as well as in the diary about the subjective feelings of the participants and their assessment of whether they have enough time at their disposal for different activities.

Subjective questions in the personal questionnaire

In the personal questionnaire the participants are asked to describe their personal sensation about the time they spend on 13 different areas of life (e. g. household care, employment, personal interests or friends). More specifically they are asked whether or not the time they spent on these specific areas during the past four weeks was enough. They give their answer on a five-point scale from "totally enough" to "not at all enough". As the pretest shows, spending "not enough" time on an activity (e. g. household care) can either be attributed to time restrictions or to a lack of motivation. One has to keep this fact in mind when interpreting the survey results.

The second subjective question is about the topics of time stress and time wishes referring to oneself, family or friends. Here the participants can agree or disagree with statements regarding the topic on a five-point scale from "agree completely" to "disagree completely". Furthermore, at the end of the personal questionnaire, the respondents are asked about their time wishes. They can use their own words to answer the question "For which activity do you want to have more time?". By allowing a free description of the answer one gets all sorts of activities and the participants are not affected by a choice of possible answers. The answers are classified in the same way as is done with the diary activities.

Subjective questions in the diary

Besides the above questions about travels and characteristics of the day, additional personal questions about time perception are to be answered at the end of each day. The respondents are asked to describe the activity that gave them the greatest pleasure and as well the one that gave them the least.

Furthermore they are asked for which activity they would have liked more time during the past day. They describe the activities in their own words and code them on the basis of the coding list. The participants are only allowed to describe activities of the specific diary day.

The number of activities the participants can describe is not specified exactly. However, a maximum number of three different activities is assumed when processing the data.

The question about time wishes is picked up both in the personal questionnaire and the diary. However two different concepts are pursued for subsequent analysis: The personal questionnaire gives a general view about the time use, the diary is linked to specific diary days. For instance different time perceptions on weekdays vs. weekend days can be analysed.

The survey will show what problems may occur with the questions about subjective time perception, what new findings can be reached from the analysis and if they can be a useful addition according to the requirements of the Stiglitz Report.

Conclusions

The presentation will focus on the methodology of the time use survey 2012/2013. The German TUS' concept is based on the two surveys of 2001/2002 and 1991/1992 and takes the European requirements according to the HETUS Guidelines into account. During a period of twelve months (August 2012 – July 2013) about 5,000 households and about 12,000 persons will be asked on a voluntary basis. A household questionnaire and, for each person from the age of ten living in the household, a personal questionnaire will be completed and a diary kept. First results are expected at the end of 2014.

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INNOVATIONS AND LESSONS FROM THE UK 2014-2015 EVERYDAY LIFE SURVEY

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The United Kingdom has a long history of time use research, spanning back to the early 20th century (Pember Reeves 1913). The Multinational Time Use Study includes British surveys collected in every decade since the 1960s (Fisher and Gershuny 2013). While the UK participated in the first round of the Harmonised European Time Use Surveys project, the most recent official survey was a small-scale light diary attached to four waves of the 2005 Omnibus survey – until now. The Centre for Time Use Research raised funding from the Economic and Social Research Council (grant ES/L011662/1) to conduct a second round British HETUS survey, which has been in the field from April 2014 through June 2015, with an additional period of data collection in the autumn of 2015.

CTUR commissioned the National Centre for Social Research (NatCen) to administer the survey. We initially sampled 10,960 private households drawn from the Postcode Address File (PAF) covering England, Wales, Scotland, and the Land Property Services Agency (LPSA) in Northern Ireland. In the main period of data collection, over 7,600 people in over 4,000 households returned at least one completed diary. The additional period of fieldwork involves different interviewers re-approaching some initial non-respondents as well as a fresh sample of new households to boost the overall response rate.

The survey includes an advance letter, then face to face follow-up with an interviewer, who collects a household questionnaire, then collects individual questionnaires from all household members aged 8 and older. Interviewers leave behind two time diaries and a one-week work schedule with each diarist (person eligible for the individual interview). All household diarists are asked to complete their work schedule for the same week and their diaries on the same two days (one week day and one weekend day) during the work schedule week. Following HETUS guidelines, the diaries contain 10 minute time slots for the period of 4AM through 4AM the next calendar day, and include columns for people to enter main and simultaneous activities as well as locations in their own words.

The diaries require a significant time input from participants. Each person who completed a diary was given a £10 gift voucher as token of appreciation for their participation. Experience on the doorstep showed that selling the survey as research into everyday life to find out what

activities most contribute to people's wellbeing proved more effective than other approaches. NatCen also collects surveys with similar degrees of participation burden and higher response rates in collaboration with a number of UK government agencies. We suspect that British people may be more willing to participate in surveys more directly linked to government policies than in surveys co-ordinated by universities.

Initial review of the returns so far indicate that the survey has collected high quality data. Three features of the UK diary instrument offer new research opportunities currently not widely available in the time use field: allowing participants to record multiple secondary activities; including a tick-box for events which involved the use of a smart device; and collection of enjoyment ratings alongside each event. Our experience collecting these features raises questions for how this field handles some dimensions of capturing activities.

Conventionally, most time use surveys collect only a one main and one secondary activity. HETUS guidelines suggest asking participants to report only a single secondary activity (if they did more than one thing at the same time). Some participants in previous HETUS surveys nevertheless wrote more detailed activity descriptions, even with this instruction, forcing coders to prioritise which part of the account to code. Some multi-tasked activities have policy implications. In this survey, the secondary activity column asked only "If you did something else at the same time, what else did you do?"

In the beta version of the data (not including the final period of data collection), 92.8% of diaries contained at least one secondary activity in at least one episode. A smaller number, 37.5% of diaries, included two secondary activities in at least one episode, and a further 5% of diaries included three secondary activities at the same time at least once. Where participants recorded multiple simultaneous activities, coders entered these activities in the order in which participants wrote their account in the secondary activity field. Table 1 shows that a wider range of activities appear only as a first (or only) secondary activity.

Table 1
Most common UK secondary activities in 2014-15

	1st Mention	2nd Mention	3rd Mention
1) Eating; 2) Housework; 3) On-line activites; 4) Personal care; 5) Reading to children, 6) Socialising; 7) TV/Radio/Music	X	X	X
8) Fill in diary; 9) Pet care; 10) Rest; 11) Sleep	X	X	
12) Adult care; 13) Child care; 14) Computer games; 15) Education & Study; 16) Exercise & Sport; 17) Paid work; 18) Shops & Services; 19) Travel; 20) Volunteering	X		

Source: United Kingdom 2014-2015 Everyday Life Survey,
beta version (not including last round of fieldwork), own calculations.

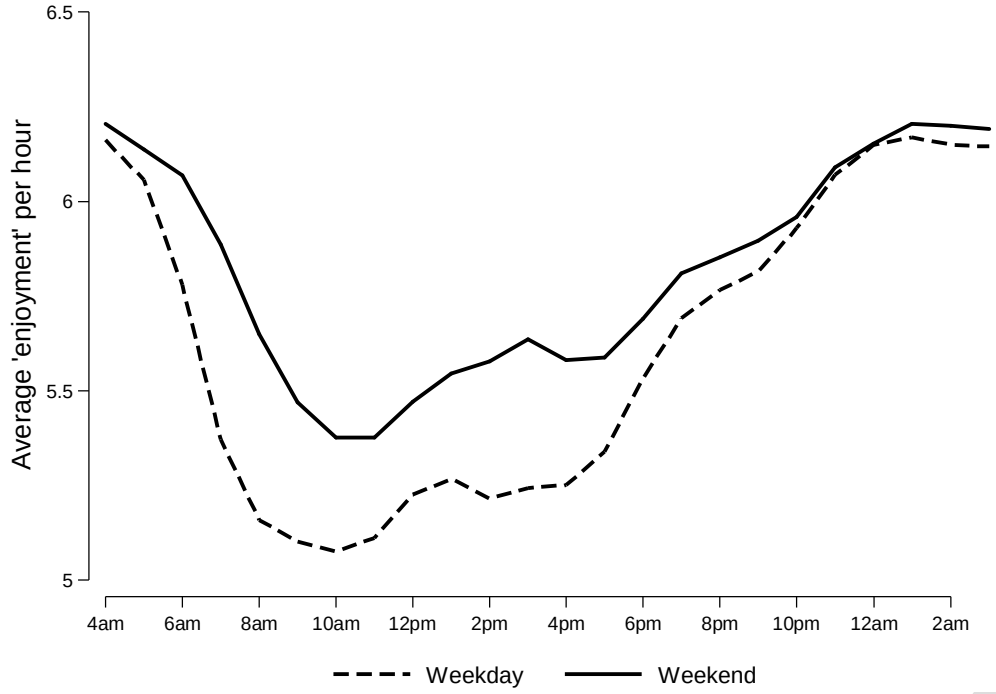
Nevertheless, some of the common activities that also appear as a second or a third simultaneous activity have policy implications. Eating behaviours are associated with quality of life, health, and risk of obesity (Oh et al. 2014). Reading to children can have beneficial effects on children's language development and education outcomes (Mullan 2014). Patterns of sleep not only have association with health but also reflect changing social expectations (Hsu 2014, Michelson 2014) – the appearance of sleep as one of three simultaneous activities raises concerns as well as curiosity. Knowing the extra detail additionally may inform investigation of levels of physical activity as well as the environmental impact of chains of behaviours. These examples reflect only some of the possibilities to investigate simultaneous activities that this survey will facilitate. Results of such research might give rise to arguments to allow diarists to report more detail of their activities (or reinforce the current practice of collecting only one secondary activity).

The current UK HETUS survey includes a "how much did you enjoy this time" rating column at the end of the diary grid. Surveys in the mid-1980s in both the USA and the UK included similar enjoyment rating scales for all activities. The 2009-10 French and 2008-09 Italian HETUS surveys also included an enjoyment column for all activities. The French survey asked people to rank activities from -3 to +3 (a seven point scale), and included this column only in a subsample of the diaries. A limited number of other surveys, including the American Time Use Survey, have asked six or more affect questions of three randomly selected events in a time diary.

This survey initially followed the French diary example, adding the enjoyment field for all activities only in a sub-sample of the diaries. Interviewers reported that they found sampled household members showed more interest in the survey when they were selected to complete the diary that included the enjoyment field, compared with those selected to complete the HETUS diary without this field. Early response rates in the UK were higher in households given the enjoyment diary. For this reason, all diaries in the remaining three-quarters of the UK HETUS survey fieldwork included the enjoyment field. The figure shows that Britons enjoy time periods when most people are home more than time when most people are at work, and enjoy weekends more than week days.

Diary level measures matter. First, policy research using well-being both seeks to promote greater well-being, and also to reduce harm and suffering. Negative daily experiences are associated with negative overall outlook, but negative experiences have separate drivers and mitigators. Activity level affect data inform understanding of what factors in the day make some experiences particularly unpleasant for certain groups of people and how policy might alter circumstances of daily experience to reduce the negativity of these experiences.

Figure 1
Enjoyment ratings (7= highest enjoyment) by time of day on week days and weekend days in the United Kingdom in 2014-2015



Source: United Kingdom 2014-2015 Everyday Life Survey,
beta version (not including last round of fieldwork), own illustration.

Second, policies which change people's behaviours generate unintended consequences. Convincing people to do more of something (like walking), less of something (like smoking) or to switch mode of doing something (more cycling, less driving), opens space in the day to be filled by other activities, reduces space in the day, forcing people to modify time in other activities, or puts people in locations and contexts that change other activity choices (Fisher, Shahbazian and Sepahvand 2012). A policy may generate any of a range of outcomes:

- A policy may succeed in fostering a behaviour change, but also incentivise other changes of behaviour that have negative consequences, and make the overall effect of the policy worse than doing nothing.
- A policy may succeed in fostering behaviour change, and produce neutral or complimentary entailments, making the overall policy a success, possibly a greater success than anticipated.
- A policy may have no effect whatever.
- A policy may fail to achieve the desired behaviour change, but incentivise other behaviour change that has positive policy value.
- A policy may fail to achieve the desired behaviour change and incentivise other undesired behaviour changes.

Emotional responses can represent a significant part of the judgement of the success of failure of a policy. For example, people who smoke modest amounts and smoke more often in pubs and bars may smoke less in response to an anti-smoking policy, and also report that they enjoy time in pubs and bars less on account of not being able to smoke (in the same way or at all) in these venues. Nevertheless, the enjoyment time of non-smokers in the same venues might increase. Even the light smokers might find themselves able to walk longer as a result of cutting smoking behaviours, and enjoy this additional walking time more – raising their overall reported level of life enjoyment. Diary level enjoyment or other satisfaction data addresses these questions with accuracy and detail that other survey designs cannot match.

Anecdotal evidence from the 2015 wave of the UK Millennium Cohort Survey suggests that the inclusion of the enjoyment column may have helped response rates. This column is one element of the survey the participating young people most frequently expressed an interest in completing and reported finding particularly meaningful. The French HETUS experience and early analysis of the MCS diaries (Chatzitheochari et. al. 2015) suggest that respondents are at least as likely to return completed enjoyment columns as they are to answer other context columns, and response in the enjoyment field sometimes is higher than in other context fields.

Subjective ratings of events represent an under-used element of time use surveys – but this may change soon as the value of using affect data associated with behaviour patterns to construct accounts of national wellbeing gains prominence (Gershuny 2013, Krueger 2009). Analysis of the UK HETUS will contribute to methodological research into which diary approach best captures affect for policy purposes.

Since the first round, HETUS survey codes have distinguished some activities that take place on the internet and smart devices from off-line activities (for instance distinguishing household management on-line or using a banking app from off-line household management). Already, research considers the possibility that technologies might speed up the way people live their lives (Wajcman 2015). During preparations for the second round of the HETUS, Klas Rydenstam from Statistics Sweden noted a complication related to measuring internet-based activities: people for whom such behaviour is long-established and routine may feel less inclined to report this detail than those who recently started using smart devices. He proposed a tick-box for the use of the internet or smart devices. A limited number of HETUS surveys implemented this tick box. The French survey added this column only in a subsample of the diaries.

All diaries in this survey contain this tick box for a "yes" answer to the question "Did you use a smartphone, tablet, or a computer?" positioned just after the secondary activity column and before the location column. The UK survey additionally followed HETUS activity coding guidelines. If a diarist wrote an activity description like "ordered pizza using just eat app", this would be coded as "3722: shopping for and ordering food via the internet". As a result, the UK can give insight into the impact of adding this column by allowing comparison of the difference between using activity reports alone and using the device tick box.

The smart device column increased the number of episodes (changes of report in any diary column from the information on the previous 10 minute time slot) by nearly 4%. The mean daily time on-line in the UK rises from 50 minutes to over 2.5 hours with the addition of the tick box column. These device-tick-box-driven episodes would not appear in the traditional HETUS design without this column (shown in Table 2). Also, the tick box collected information modifying sleep, paid work, and education which otherwise would not have been collected in the traditional HETUS design (in the UK, apps monitoring quality of sleep attract many downloads).

Table 2
Smart device and web use reports in UK HETUS surveys

	2000-01	2014-15 (Act codes)	2014-15 (Tick box)
% of episodes **only** from smart device use shifts	none	none	3.7%
% of episodes involving smart device use shifts	1.7%	7.1%	19.3%
% of diaries with no smart device or web use	85.3%	47.2%	22.8%
% of diaries with 24 hour smart device/web use	none	none	0.1%

Source: United Kingdom 2014-2015 Everyday Life Survey,
beta version (not including last round of fieldwork), own calculations.

The UK HETUS experience suggests that future surveys would benefit from including a similar device tick box column. Testing in the UK suggests that this column does not increase participant burden. Even though this is an extra column in the diary, the device tick box also offers a shorthand way of reporting some activities and might save more conscientious diarists time for some accounts. Adding this column is not unproblematic, however. By increasing the episode count and changing the reporting of some activities, the device column also introduces an element of complexity into analysis of changes of behaviour across time. Adding this device column requires analysis of the impact of this column to construct backwards comparability calibration strategies.

Once the data are released in the spring of 2016, we hope many researchers will make the most of this data.

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INTRODUCING THE AMERICAN HERITAGE TIME USE STUDY DATA EXTRACT BUILDER (AHTUS-X)

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Patterns of daily activities situated in the context of the location, time of day, presence of others and emotional experiences which time diaries collect offer essential data enabling us to understand what factors drive long-term trends in behaviour, and to predict how policies might encourage desirable shifts in behaviour while avoiding simultaneous change that might undermine policy aims. As daily life offers an essential dimension to a vast range of research topics, time use surveys offer better value for money than most surveys considering the potential uses for the money expended on data collection. To achieve this value for money, however, researchers need to use the data. Even now, few universities offer training in the analysis of time use data.

Making access to customised data subsets ready for analysis quickly matters to the success and continued expansion of this field. The IPUMS Time Use data extract builder suite is one tool delivering essential data resources to time use researchers. This timepiece details the release of the latest project in this collection of archives, the American Heritage Time Use Study Data Extract Builder (AHTUS-X).

Background

Time use researchers at the Maryland Population Research Center and Minnesota Population Center, with funding from the National Institutes of Health and the United States Department of Agriculture Economic Research Service, developed the extract system alongside the early years of the American Time Use Survey, funded and managed by the Bureau of Labor Statistics and collected by the United States Census Bureau. The ATUS is the first large-scale continuous national time use study. The ATUS is a ninth wave extension of a subsample of the longitudinal Current Population Survey (CPS). The initial project – the American Time Use Survey Data Extract Builder (ATUS-X) – aimed to ease the use of the complex combination of CPS and ATUS files. An earlier time piece in the eIJTUR (Hofferth, Flood, and Fisher 2012) details the extension of the ATUS-X, and outlined plans to expand this project into a suite of archives also covering historical time use data from the USA and harmonised international collections of time use data. The development of the new dimensions involves collaboration with the Centre for Time Use Research at the University of Oxford. The Minnesota Population Center Integrated Public Use Microdata Series (IPUMS) houses the IPUMS Time Use data extract builder archives.

The logical first companion resource to join the ATUS-X is the American Heritage Time Use Study (AHTUS-X). The ATUS builds on a long history of time diary data collection in the USA, which dates back to the early part of the 19th century (Kneeland 1929, Sorokin and Berger 1939). The first large scale national sample time use survey in the USA accompanied the 1965-66 US contribution to the Multinational Time Budget Research Project, the first input-harmonised comparative time use survey involving twelve mostly European countries (Godbey and Robinson 1997). Combinations of academic and national government agencies have collected at least one large scale national time use survey every decade since (Fisher and Gershuny 2015).

In 2003, Yale University secured funding from the Glaser Progress Foundation to construct a harmonised archive of national USA time use surveys as a part of a wider Program on Non-Market Accounts project. Yale University commissioned the Centre for Time Use Research, then based in the Institute for Social and Economic Research at the University of Essex in the United Kingdom, to create this archive. The resulting American Heritage Time Use Study includes three files with cross-time harmonised variables for each survey:

- a collection of person and household demographic variables

- a summary files where each row represents the account of one person's day and total time spent in various activities appears in each column, and
- an episode file, where each row represents a change in at least one dimension of each participating diarist's day.

Later grants from the NIH and British Economic and Social Research Council facilitated the extension of the AHTUS to cover surveys not included in the original project. The AHTUS episode files informed the development of the episode file of the Multinational Time Use Study (Fisher and Gershuny 2013). Elements of the MTUS will be released as a new IPUMS Time Use archive in 2016.

The Centre for Time Use Research independently releases a set of the three harmonised files for each survey included in the AHTUS. Users combine surveys sets as required and delete or ignore variables they do not need. The new AHTUS-X draws on a database of all AHTUS survey cases and variables, speeding the process of accessing the cases users require for research.

Surveys Included in the AHTUS-X Archive

The datasets currently harmonised in the AHTUS-X (Fisher and Gershuny 2015) include:

- **1965-1966 - Multinational Comparative Time-Budget Research Project**, including a Jackson, Michigan and a national USA sample, conducted by the Survey Research Center at the University of Michigan and the Social Relations Department at Harvard University, with funding from the National Science Foundation (part of the Szalai Multinational Time Budget Research Project).
- **1975-1976 - American's Use of Time: Time Use in Economic and Social Accounts**, a panel study designed and administered by the Survey Research Center at the University of Michigan with funding from the National Science Foundation and the US Department of Health, Education, and Welfare.
- **1985 - American's Use of Time**, administered by the Survey Research Center, University of Michigan, with funding from the National Science Foundation and ATT, designed to compare the impact of self-completion mail-back, telephone interviewing, and face-to-face interviewing diary collection.
- **1992-1994 - National Human Activity Pattern Survey (NHAPS)**, administered by the Survey Research Center at the University of Maryland for the Environmental Protection Agency to produce data on exposure to environmental pollutants. This survey collected diaries from people of all ages, but did not ask marital status or income.
- **1994-1995 - National Time-Diary Study (NHAPS extension)**, administered by the Survey Research Center at the University of Maryland on commission for the Environmental Protection Agency to produce data on exposure to environmental pollutants. This survey collected an adult-only supplement as the original survey had only a single activity code for computing; however, this extension includes marital status and household income.

- **1998-2001** - This data set combines two small-scale surveys collected by the University of Maryland Survey Research Center, the **1998-99 Family Interaction, Social Capital, and Trends in Time Use Study (FISCT)**, a small-scale contiguous state sample funded by the National Science Foundation, and the **1999-2001 National Survey of Parents (NSP)**, funded by the Alfred P. Sloan Foundation.
- **2003-2014 - American Time Use Survey (ATUS)** conducted by the United States Census Bureau and funded and co-ordinated by the United States Bureau of Labor Statistics, which collected diaries from a sub-sample of the population that had just completed the last of eight waves of the Current Population Study.

Developments and Future Plans in the AHTUS and AHTUS-X

Some small improvements are entering the AHTUS original files, distributed on the Centre for Time Use Research website (http://www.timeuse.org/ahtus) and the AHTUS-X website (www.ahtusdata.org) simultaneously in 2016. These improvements involve breaking the current sport and exercise code into four codes:

- team sports and training
- dancing
- equestrian sports
- other sports activities;

The AHTUS additionally will include some new codes which make the multi-purpose nature of some activities (for instance travel related to job searches) more evident than at present.

CTUR has recovered 1920s and 1930s USDA paper diaries, and longer-term will be adding these to the AHTUS and AHTUS-X. The 2006 Princeton Affect and Time Survey (PATS), modelled on the ATUS, in which Daniel Kahneman and Allan Krueger trialled the emotion questions now collected in the ATUS well-being modules, will be added in the not too distant future.

How Does the AHTUS-X Differ from the ATUS-X

Current users of the ATUS-X will find a familiar layout in this new resource, with additional features. While the ATUS only collected one diary from one person in sampled households, and only collected limited ranges of secondary activity, other USA surveys collected more than one time diary from multiple household members, and many surveys encouraged more detailed reporting of secondary activities. The sample selection process in the ATUS-X swiftly guides users through the range of surveys including each feature, facilitating construction of appropriate extracts accordingly.

Use Enables Reuse

As with all archives, continued funding for this project depends on people using the resource. If you have an interest in time use patterns in the USA, you both access essential data and con-

tribute to the long-term preservation of this collection of documented historical change by visiting and making extracts from www.ahtusdata.org.

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A MIXED-MODE APPROACH TO MEASURING YOUNG PEOPLES' TIME USE IN THE UK MILLENNIUM COHORT STUDY

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The longitudinal Millennium Cohort Study (MCS) follows over 19,000 children born between 2000 and 2002 in the United Kingdom. The sixth round of fieldwork, when most participants are aged 14, began in January 2015 and concludes in early 2016. The cohort members and their families were visited by interviewers, who conducted a range of measures, including interviews, cognitive assessments, physical measurements, and saliva sample collection.

In addition, the MCS added two 24-hour time diaries, one for a week day and one for a weekend day. These days were randomly selected, and fell in the 10 days following the interviewer visit. Participants additionally wore an accelerometer during their two diary days.

The MCS time diary included 44 pre-defined, age-specific main activity codes. Participants additionally also were asked to record limited location detail (at home, away from home indoors, away from home outside), enjoyment on a 5-point scale, and who was with them at the time of each activity. The development process prior to the mainstage of fieldwork included cognitive testing of activity codes as well as two rounds of instrument usability testing, followed by two pilot phases. In this paper we describe the instruments, examine data from the two pilot phases and consider lessons for future surveys (more detail available in Chatzitheochari et. al. 2015).

Young people of this generation have grown up using the internet and smart technologies. Web and smart platforms offer opportunities to provide highly customised support to participants and to reduce processing of raw responses into research data. The MCS capitalised on these opportunities with an innovative mixed-mode data collection approach, including a smartphone diary app, a web diary, and a paper diary (shown in Figures 1-3).

The paper diary followed a conventional light diary format, where participants marked cells on pre-coded grids. The web diary mirrored the paper diary in the ordering of sections, but rather than presenting all choices at once, the web survey offered unfolding clusters of categories. This was to ensure the diary was usable on a computer screen, and enabled participants to see only the most relevant options on the screen at any one time. During instrument usability testing, participants reported confusion following the time points on the web grid. Adding a digital clock showing the time at the point of the cursor addressed this complication. As with the paper diary, the web diary allowed participants to complete diary domains in any order.

Like the web diary, the app nested sets of activity and context categories. As the small screen format imposes greater limitations, we used a question-based approach to reporting activities and contexts, rather than a grid. In this case, we defined episodes in terms of main activities. To start a new entry, the participant had to enter a main activity, select the end time of the activity, then complete the context details of the episode. The app thus organised reporting in terms of main activities – in contrast to the whole story and time of day organisation of accounts in the other instruments.

Participants could report a change in one or more context (location, enjoyment, who else was present) domains by entering a new episode of the same main activity. In all three diary instruments, episodes reflect changes in reporting of each diary domain (activity, location, who else was present, and enjoyment) individually, as well as in all combinations. Web and paper diaries collected a greater volume of episodes not associated with a change of the main activity than the app did.

The nesting of categories worked well in the web and app diaries. The three location codes proved less than ideal in early analysis as it is not always possible to triangulate movement between places combining the "indoors" and "outside" categories with the activity codes. We were limited by the physical space of readable font on paper for the final activity and context code lists. It may be possible for pre-coded web and app diaries to accommodate a modest number of additional codes across all domains with the nesting approach.

Interviewers offered participants the choice of either the web or app options, adding the paper alternative for those without ready access to appropriate devices, or those who refused to use the web and app modes. Once a young person selected a mode, they had to stick with this mode for both diaries. Future surveys might investigate whether allowing participants to switch mode might increase response rates for more reluctant participants. We found that take-up of the paper alternative proved higher than anticipated (around 20% in both pilot surveys). However, this was partly driven, we believe, by interviewer error, where some interviewers offered paper diaries upfront. More young people selected the app than the alternatives in the two pilot stages of the survey.

Figure 1
MCS paper-administered time-use diary; first grid page

WHAT WERE YOU DOING?		4am 10 20 30 40 50	5am 10 20 30 40 50	6am 10 20 30 40 50	7am 10 20 30 40 50	8am 10 20 30 40 50	9am 10 20 30 40 50	10am 10 20 30 40 50	11am 10 20 30 40 50	WHAT WERE YOU DOING?	
Sleep and personal care	Sleeping and resting (including sick in bed)									Sleeping and resting (including sick in bed)	Sleep and personal care
	Personal care (including taking a shower/bath, grooming, getting dressed etc.)									Personal care (including taking a shower/bath, grooming, getting dressed etc.)	
School, homework, and education	Homework									Homework	School, homework, and education
	In class									In class	
	School breaks									School breaks	
	School clubs									School clubs	
	Detention									Detention	
Paid or unpaid work	Paid work (including paid babysitting and paid work for the family)									Paid work (including paid babysitting and paid work for the family)	Paid or unpaid work
	Unpaid work for family or other non-household members (e.g. help in family business)									Unpaid work for family or other non-household members (e.g. help in family business)	
Chores, housework, and looking after people or animals	Cooking, cleaning, and shopping for the household									Cooking, cleaning, and shopping for the household	Chores, housework, and looking after people or animals
	Fixing things around the house, fixing bike, gardening									Fixing things around the house, fixing bike, gardening	
	Looking after brothers, sisters, other children in the household									Looking after brothers, sisters, other children in the household	
	Looking after parent or other adult in the household (medical or personal care)									Looking after parent or other adult in the household (medical or personal care)	
	Looking after animals									Looking after animals	
Eating and drinking	Eating or drinking in a restaurant or café									Eating or drinking in a restaurant or café	Eating and drinking
	Eating a meal									Eating a meal	
	Eating a snack or having a drink									Eating a snack or having a drink	
Physical exercise and sports	Cycling									Cycling	Physical exercise and sports
	Individual ball games and training (e.g. tennis, badminton)									Individual ball games and training (e.g. tennis, badminton)	
	Jogging, running, walking, hiking									Jogging, running, walking, hiking	
	Team ball games and training (e.g. football, hockey)									Team ball games and training (e.g. football, hockey)	
	Swimming and other water sports									Swimming and other water sports	
	Other exercise (e.g. dancing, keeping fit) and other sports (e.g. skateboarding, gymnastics)									Other exercise (e.g. dancing, keeping fit) and other sports (e.g. skateboarding, gymnastics)	
Travelling (including walking to school)	Travel by bus, taxi, tube, plane									Travel by bus, taxi, tube, plane	Travelling (including walking to school)
	Travel by car, van (including vehicles owned by friends and family)									Travel by car, van (including vehicles owned by friends and family)	
	Travel by physically active means (walk, bike etc.)									Travel by physically active means (walk, bike etc.)	
Social time and family time	Attending live sporting events									Attending live sporting events	Social time and family time
	Cinema, theatre, performance, gig etc.									Cinema, theatre, performance, gig etc.	
	Exhibition, museum, library, other cultural events									Exhibition, museum, library, other cultural events	
	Shopping (including window shopping, hanging out at shopping centre)									Shopping (including window shopping, hanging out at shopping centre)	
	Speaking on the phone (including Skype, video calls)									Speaking on the phone (including Skype, video calls)	
	Speaking, socialising face-to-face									Speaking, socialising face-to-face	
Internet, TV, and digital media	Answering emails, instant messaging, texting									Answering emails, instant messaging, texting	Internet, TV, and digital media
	Browsing and updating social networking sites (e.g. Twitter, Facebook, BBM, Snapchat)									Browsing and updating social networking sites (e.g. Twitter, Facebook, BBM, Snapchat)	
	General internet browsing, programming (not time on social networking sites)									General internet browsing, programming (not time on social networking sites)	
	Listening to music, radio, iPod, other audio content									Listening to music, radio, iPod, other audio content	
	Playing electronic games and Apps									Playing electronic games and Apps	
	Watch TV, DVDs, downloaded videos									Watch TV, DVDs, downloaded videos	
Volunteering and religious activities	Volunteering									Volunteering	Volunteering and religious activities
	Religious activities (including going to places of worship, praying etc.)									Religious activities (including going to places of worship, praying etc.)	
Hobbies and other free time activities	Did nothing, just relaxing, bored, waiting									Did nothing, just relaxing, bored, waiting	Hobbies and other free time activities
	Hobbies, arts and crafts, musical activities, writing stories, poetry etc.									Hobbies, arts and crafts, musical activities, writing stories, poetry etc.	
	Reading (not for school)									Reading (not for school)	
Any other activity	Other activities not listed									Other activities not listed	Any other activity
WHERE WERE YOU?		4am 10 20 30 40 50	5am 10 20 30 40 50	6am 10 20 30 40 50	7am 10 20 30 40 50	8am 10 20 30 40 50	9am 10 20 30 40 50	10am 10 20 30 40 50	11am 10 20 30 40 50	**WHERE WERE YOU?**	
	At home									At home	
	Indoors, but not at home									Indoors, but not at home	
	Outdoors									Outdoors	
WHO WERE YOU WITH?		4am 10 20 30 40 50	5am 10 20 30 40 50	6am 10 20 30 40 50	7am 10 20 30 40 50	8am 10 20 30 40 50	9am 10 20 30 40 50	10am 10 20 30 40 50	11am 10 20 30 40 50	**WHO WERE YOU WITH?**	
	Alone									Alone	
	Mother									Mother	
	Father									Father	
	Friends or other young people (up to 18 years old)									Friends or other young people (up to 18 years old)	
	Siblings (brother or sister)									Siblings (brother or sister)	
	Other adults									Other adults	
HOW MUCH DID YOU LIKE IT?		4am 10 20 30 40 50	5am 10 20 30 40 50	6am 10 20 30 40 50	7am 10 20 30 40 50	8am 10 20 30 40 50	9am 10 20 30 40 50	10am 10 20 30 40 50	11am 10 20 30 40 50	**HOW MUCH DID YOU LIKE IT?**	
	1 - Strongly liked									1 - Strongly liked	
	2 - Liked									2 - Liked	
	3 - Neither liked nor disliked									3 - Neither liked nor disliked	
	4 - Disliked									4 - Disliked	
	5 - Strongly disliked									5 - Strongly disliked	

Figure 2
Web-administered MCS time-use diary (showing digital clock)

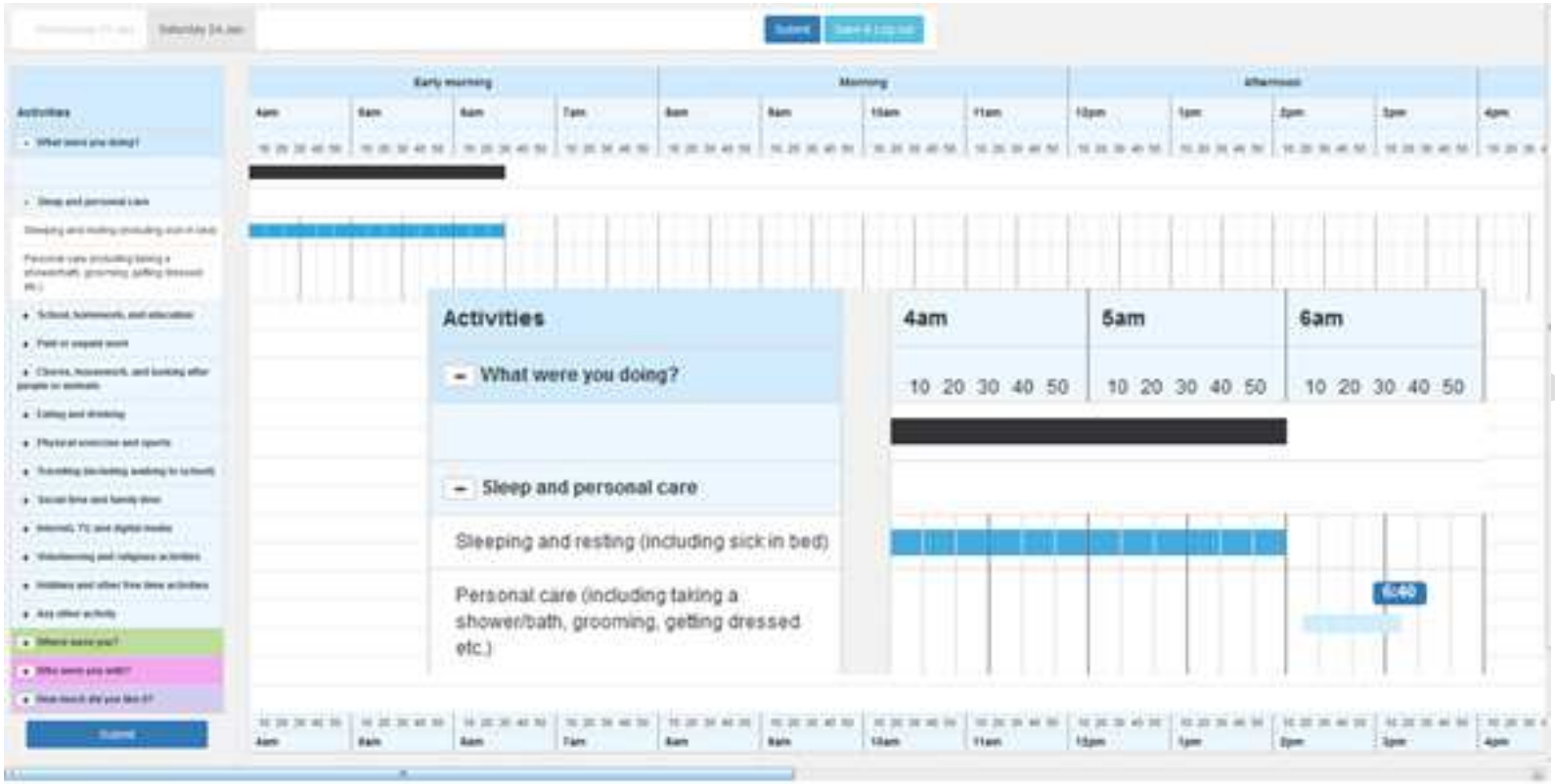
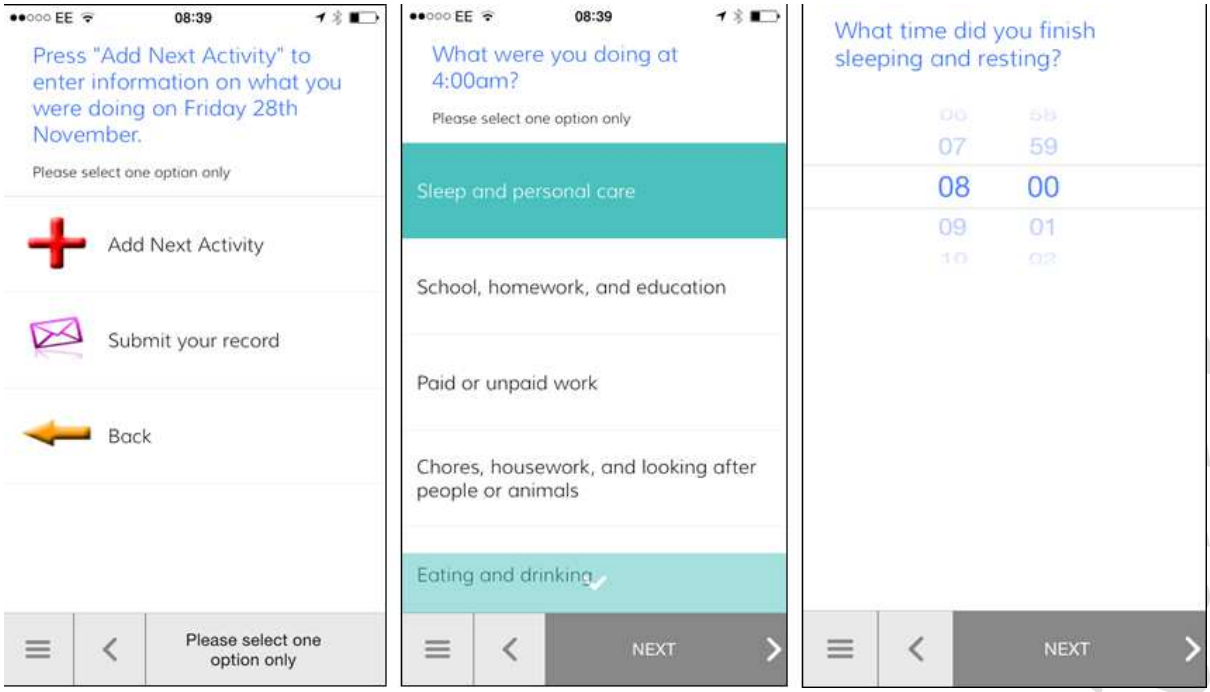


Figure 3
MCS time-use app screen shots



In the first pilot, roughly 70% of both online and paper diaries included episodes with secondary activities, consistent with reporting of secondary activities by young people of similar age in the 15 surveys included in the Multinational Time Use Survey with lower sampled age ranges (Fisher and Gershuny 2013). Secondary activity collection proved problematic with the app, and this survey dropped this field in the second pilot. Future surveys may find better solutions to capture secondary activities with app instruments.

Nearly half of participants returned two diaries of sufficient quality for analysis in the pilot phases. Another 35% returned one good quality diary. As Figure 4 shows, girls were slightly more likely than boys to return at least one usable diary – though girls also were more likely to return some information in one diary, and leave the second diary blank. Boys were more likely not to return the diaries, or to return two incomplete diaries.

One activity code, "44 - Other activities not listed" – may have reduced the level of good quality diary returns. A minority of participants selected this option, and of these, a smaller minority used the option as intended for short duration events in days otherwise well described. More young people choosing this option seemed to use it as an alternative to completing the diary – blocks of 4 to 24 hours of "other activities" effectively are missing data.

Figure 4
MCS diary response patterns (both pilot phases combined)

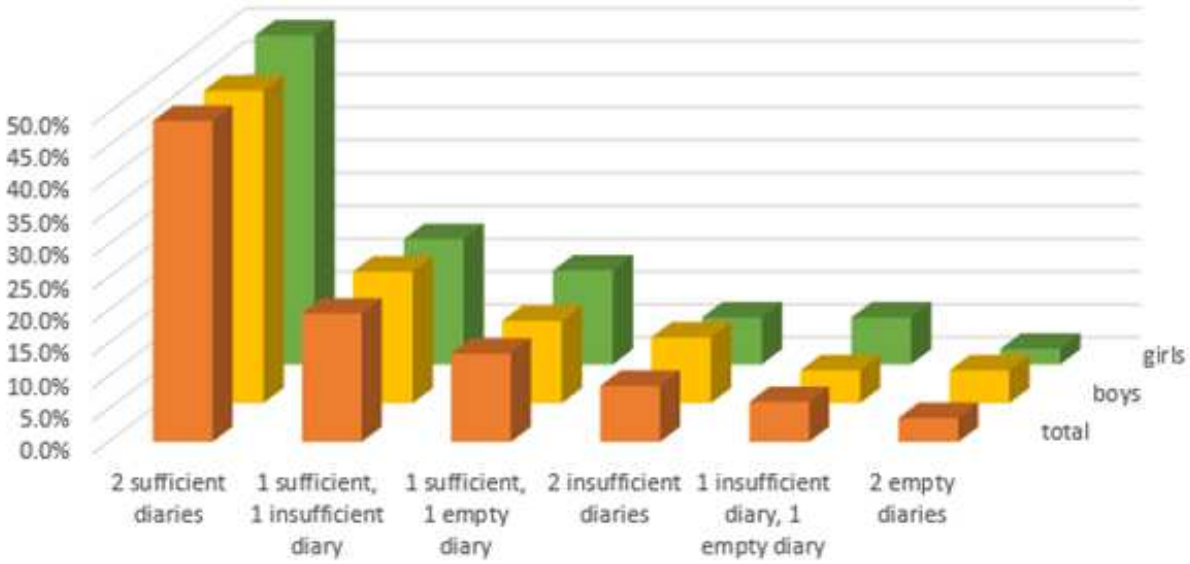


Figure 5
Percentage of good quality diaries by mode and pilot phases

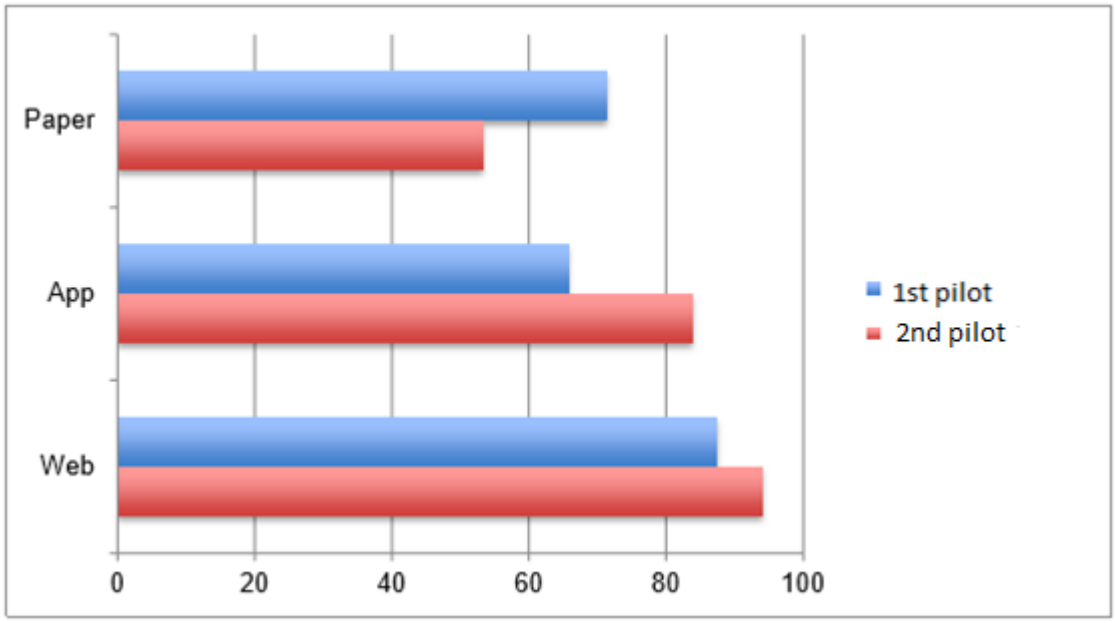


Figure 5 shows that the web mode collected the highest percentage of usable diaries. The paper diaries performed less well, largely as paper diarists did not receive feedback to amend errors. Automated prompts in the app and web instruments guided participants to return more complete records. As the diaries represented one supplement of a multi-element cohort study, arranging interviewer follow-up with the paper diaries was not practical and may have overbur-

dened participants, risking future participation in this survey. Future mixed mode surveys which can accommodate offering similar levels of support to people completing instruments of each mode might produce more comparable mode quality.

The activity distributions in the piloting phases were largely similar by mode, and modest variations more likely reflect small pilot samples rather than instrument performance. All three modes collected a mean of 26 episodes (paper and web diaries elicited more episodes than the app diaries, but even the app collected a mean of 22 episodes – which compares favourably to the means in paper and telephone interview survey diaries completed by young people and included in the MTUS). Overall, the instruments performed well.

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Fisher, K. and J. Gershuny (2013), Coming full circle – Introducing the Multinational Time Use Study Simple File, in: *Electronic International Journal of Time Use Research*, Vol. 10, No. 1, 91-96.

Acknowledgement

The development of the MCS time diary instruments was supported by the ESRC "Centre for Longitudinal Studies Resource Centre 2010-2015" grant (award number: RES-579-47-0001), as well as the ESRC "Millennium Cohort Study Sweep 6 (Age 14) Survey" grant (award number: ES/K005987). Supplemental funding was received from the ESRC cross-investment grant "Children's time use diaries: promoting research, sharing best practice, and evaluating innovations in data collections internationally" (award number: ES/F037937) that was a partnership between the Centre for Time Use Research (CTUR) at the University of Oxford and the Centre for Longitudinal Studies (CLS) at the UCL Institute of Education, University College London. CLS led this work in collaboration with CTUR and Ipsos MORI.

REFLECTIONS ON MEASURING TIME ALONE

Kimberly Fisher
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Time use surveys have included columns for participants to report time spent alone for decades. Early surveys, including those in the Szalai samples, included open-ended columns for people to note who they were with using their own words (Robinson 1977). More recently, phone sur-

veys tend to include a filter question asking if diarists were alone or with others. Paper and web-based diaries tend to offer a tick box in the who else was present section for people to designate time spent alone. Very little research analyses this wealth of data on time spent alone. This time piece sets out reasons why this field might benefit from thinking about what "being alone" means conceptually, what aspects of time alone might matter most for policy (hence should be captured in time diaries), and how we best collect data on this concept.

Some recent literature documents the time use of people who live alone. Utz (2014) examined the prevalence of walking and other healthy behaviour among people living alone in the USA who have or look after pets. Hanifi (2012) profiles the daily activities of men in Finland in single person households. Baxter (2011) examined the activities of Australians who reported having time on their hands – and those who made such reports in 1997 and 2006 were more likely to live alone (though Baxter does not consider time with and not with others, just the activity profiles of people who report having time on their hands).

More articles concentrate on time spent alone by specific populations of particular policy concern. Aizer (2004) summarised the literature on children and young people in the USA who spent time without adult supervision after school while their parents worked, and conducted original analysis showing an increased risk of anti-social and other problematic behaviours for those children spending less time in the care of adults. Golant (1984) and Jun (2014) demonstrate that longer time spent alone can serve as a measure of social isolation associated with negative health and well-being outcomes for older people.

Other research examines more general trends in time alone as an element of policy interest. Nabli and Ricroch (2013) observe a general shift from watching TV and on-line leisure as social activities to spending more time in front of screens alone in France. Older people and unemployed adults spent particularly long hours watching TV, while younger people spent longer spells in front of computers. Nabli and Ricroch (2013) note this shift not only reflects a growing proportion of the French population living alone but also that more people who live in family homes spending time apart in front of separate screens when at home. This alone and inactive time may raise health concerns. Hamrick, Hopkins and McClelland (2008) use the American Time Use Study Eating and Health Module to demonstrate the obseity risks associated with trends to preparing and eating food alone. Roberts (2014) summarises the literature examining safety concerns when people walk alone outside at night. Fisher, Shahbazian and Sepahvand (2012) show that in states in the USA with stronger environmental protection policies, people spend less time inside buildings alone, particularly less time alone engaged in energy-intensive leisure, like watching TV or playing computer games, compared to people living in states with more lax environmental regulations.

A common theme in much of the literature addressing time alone associates solo time with negative outcomes. Roeters, Cloïn and van der Lippe (2014) set out to see if spending time alone might offer respite to time-pressed employed women who also look after children or adults in the Netherlands. They found instead that for both women and men, spending a higher propor-

tion of total leisure time alone is associated with negative mental health consequences. Roeters, Cloïn and van der Lippe (2014), whose paper is the most detailed examination of the time alone literature available at the time of writing, found modest or no affects associated with time alone during other activities.

The current literature gives little consideration to what it means to be alone. Roeters, Cloïn and van der Lippe (2014) explicitly define alone as not being in the same room or space in the presence of household members, non-household family, friends or other well-known persons. When time diary instruments offer instructions defining being alone, these instructions use similar definitions. This is not the same as not being in the presence of other people.

In most surveys from most countries in the current episode file of the Multinational Time Use Study (Fisher and Gershuny 2013), the activity which features most frequently among episodes when people report being alone and also do not report other people being present in Australia, Austria, Finland, France, Germany, Spain and the United Kingdom is personal care. Personal care is the second most common activity in episodes where people report being alone in Israel, and features in the top 10 most frequent activities when people are alone in the USA. Sleep, food preparation, eating, and television viewing also feature frequently among episodes when people report being alone. While at face value, it is credible that people engage in such activities alone, there are instances where it is highly likely that other people are present. Even though the majority of instances of eating alone take place at home, there are a minority of episodes in all surveys in the MTUS where people report eating out alone in a restaurant, canteen, café, bar or pub. A small number of episodes of watching TV alone take place in cafes, bars and pubs.

In Israel, commuting appears most frequently in episodes where people report being alone and other people are not around. In the USA, personal or household care-related travel tops this list. Travel features among the ten most frequent activities in all surveys when people report being alone. Though the majority of travel alone takes place in cars, there is a sufficiently high proportion of diary episodes where people report being alone while travelling by public transport, on foot or on bicycle in public places during daylight and normal business hours to permit meaningful analysis.

In some episodes where people have reported being alone and not with others, diarists record their activities as conversation, physical child care or physical adult care, which are activities that generally necessitate interaction with other people. No research has considered what such reports might mean in terms of how we understand and explain behaviour.

The possibilities for interacting in real time with other people over the internet have expanded rapidly. Surveys increasingly explicitly code real time social media and video call interactions. At a minimum, future research should explore whether interaction with others on-line is more like face to face social time, alone time, or a distinctive form of interaction. Time use survey designers might explore how best to capture such activities. The time piece on the UK 2014-2015 Everyday Life Survey in this volume gives more detail on issues arising from adjusting

diaries to improve the reporting of on-line behaviours generally. No national survey has yet directly addressed the overlap of who else was present information with time on-line.

Time use data processing generally has proceeded under the assumption that being alone is the opposite of (or at least incompatible with) being with other people. A few surveys have documentation detailing that data cleaning involved recoding of cases where a diarist reported being alone at the same time as being with other people to simply time with other people (but not alone). Nevertheless, most surveys included in the MTUS episode file do not include cases where diaries contain reports of being alone at the same time as being with other people (except in cases of a limited number of child and adult care codes that necessarily involve the presence of another person). Only four surveys in the MTUS episode file contain episodes where diarists recorded being alone and being with other people for a range of activities (shown in the table). More recent surveys from each of these countries do not include such reports. This suggests that most surveys "correct" such reports before releasing data.

The experience with the 2014-15 UK Everyday Life HETUS Survey and the UK Millennium Cohort Survey age 14 wave (each described in other time pieces in this volume) indicates that people still report being alone while with other people in time diaries. In the UK HETUS (prior to the final period of data collection), 7916 episodes, representing 1.5% of episodes, contained in nearly one-fifth (19.4%) of diaries reflect this pattern.

Unlike the UK HETUS, which collected only paper diaries, the MCS survey conducted a mixed mode approach. From the first pilot test, the time diary app forced young people to select between alone, others present, or don't remember. Selecting others present then brought up additional options. The app diary did not allow diarists to make an alone with others report. In the two pilot phases, the web diaries and the paper diaries did allow young people to report being alone while with others, and both these modes collected this pattern. In the main stage of data collection, the web diaries were programmed like the app diaries to prevent alone with others reporting, but the paper diaries allowed and have continued to collect this pattern.

Reporting of time alone while with others

Country	Survey years	Number of episodes including alone with others reporting	% of diaries including alone with others episodes
Spain	2002-03*	1837	3.9%
UK	1987	624	5.9%
USA	1965-66^	92	4.6%
USA	1975-76	1090	23.8%

* The MTUS includes both the Spanish national HETUS survey and the Basque country survey from 2002-03; these cases only appear in the national HETUS sample.
^ In this table, the Szalai Jackson, Michigan and USA national sample surveys are combined.

Is it right to assume that all alone with others reporting reflects participant errors? If such accounts arise by mistake rather than deliberate reporting, we might expect that alone with others episodes would appear disproportionately in diaries with other data quality problems and also would be dispersed across activity categories. In both the MCS pilot testing phases and in the mainstage data collection of the UK HETUS (excluding the final additional phase of data collection), the alone with others reporting primarily appears in good quality diaries (which have a variety of activities including basic behaviours people undertake every day - sleeping or resting, eating, personal care, and some form or exercise of travel; 7 or more episodes; no more than 90 minutes of missing activity time, attached to basic demographic details about the diarist and the date the diary account reflects). Most time alone while with others in the recent UK surveys clusters with eating, sleep, resting, personal care, food preparation, housework, listening to audio or watching video content on devices, paid work, and travel. The alone with others reporting tends not to appear in out of home leisure, social activities or physical activities. In the surveys in the MTUS that include this pattern, a majority of alone with others behaviours are associated with child care in all countries (though this partly is a function of the MTUS diary harmonisation process). In the Spanish 2002-03 survey, informal social time also features with this pattern, while in the UK in 1987, alone with others often appears with personal care. In the USA in 1965-66 and 1975-76, alone with others accompanies eating, shopping and service use. Alone while with others reports accompany a variety of activities, but the distribution is not random and varies by country.

Undoubtedly some participants record being alone with others by mistake. Quality checks (prompts in app or web-administered diaries, or follow-up questions from interviewers) could distinguish errors from conscious reporting. Qualitative interviews could reveal why people might identify some time near other people as alone. Would it be worth the effort to allow participants to make this choice and to try to understand what such reports mean to people?

Many people in this field will have observed the increasingly common phenomenon of groups of people sitting together on sofas or at tables paying more attention to content on hand held devices than they are to the people with whom they are in very close proximity. It might be possible that the way people use smart devices makes the concept of being alone with others more relevant now than before. If data cleaning phases do not automatically remove such reporting as assumed error for at least a few surveys, it will be possible to test who else is present reporting further – such data can be recoded later to remove alone with others reports if researchers so desire. When these accounts are removed before data are released, however, it is not possible to reconstruct which diaries included these patterns (or not cost effective or easy to do so). We may be missing research opportunities if we limit the way we permit people to report how they spend time alone (both generally and alone with others).

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time-pieces – electronic ***International Journal of Time Use Research***
2015, Vol. 12, No. 1, 153-190 dx.doi.org/10.13085/eIJTUR.10.1.153-190

Book notes

by Kimberly Fisher

Anttila, A.-H., Anttila, T., Liikkanen, M. and H. Pääkkönen
Ajassa kiinni ja irrallaan – Yhteisölliset rytmit 2000-iuvun Suomessa (Rhythms of social and community time in Finland in the 2000s) (2015)

Publisher: Statistics Finland
Website:
http://www.stat.fi/tup/julkaisut/tiedostot/julkaisuluette-lo/yyti_aki_201500_2015_16146_net.pdf
Languages Available: Finnish

This book explores changing daily living patterns in Finland from the 1980s through the current decade. Finns now spend more time asleep on Sundays than other days, and less time with others on weekends, a change from earlier decades. Informal community time and weekend volunteering have declined, to be replaced by more time on-line or watching TV, often alone. Finns employment and earnings on weekend, by contrast, have changed little across recent decades. This book considers the role technologies have played in changing Finnish society.

Benería, L. Beriek, G. and M. S. Floro
Gender, development and globalization – Economics as if all people mattered, Second Edition (2015)

Publisher: Routledge
ISBN: 978-0-415-53749-0
Languages Available: English

This book addresses the oversight in conventional economic models of international development, which ignore the unpaid and informal economic activities of women as well as the significance of caring activities mostly performed by women. This book updates an earlier edition adding feminist economist perspectives to inform development policies. Some of the world's poorest women have been particularly disadvantaged as a consequence of many development initiatives. Policies which aim to help poor women can fail when those policies do not adequately address the time poverty and care requirements faced by these women. While all chapters have elements relevant to time use research, chapters 4 (on employment patterns and informal work) and 5 (on total work, including paid and unpaid labour) make the greatest use of time use data and information. One of the authors, Maria Floro, also was a grant applicant and an instructor on the time use training workshop programme IATUR developed to increase capacity to collect and use time use data in policy research in developing countries.

Blanchard, P., Bison, I., Bühlmann, F. and J. A. Gauthier
Advances in sequence analysis – Theory, method, applications (2014)

Contributing Authors: Andersson, H., Blanchard, P., Brzinsky-Fay, C., Bühlmann, F., Buton, F., Colombi, D., Dietrich, J., Elzinga, C. H., Fasang, A. E., Gauthier, J. A., Halpin, B., Han, S. K., Joye, D., Lemercier, C., Lesnard, L., Mariot, N., Mercklé, P., Oris, M., Paye, S., Pollien, A., Ritshard, G., Salmela-Aro, K., Wilson, M. C. and C. Zalc
Publisher: Springer eBooks
ISBN: 978-3-319-04969-4
Website:
http://www.springer.com/social+sciences/book/978-3-319-04968-7
Languages Available: English

This e-book discusses a range of sequence analysis techniques, with much discussion of optimal matching and variations on this technique, as well as other techniques, from sequence synchronisation to event history method adaptations. The book informs the use of sequence analysis in the social sciences. Chapters span more theoretical to more applied subjects. All chapters consider life events in time. The third chapter by Laurent Lesnard specifically addresses the uses of optimal matching with time use data. Other familiar names in the field, including Brendan Halpin, contribute elements to this book.

Calero, A., Dellavalle, R. and C. Zanino
Uso del tiempo y economía del ciudado (Time use and the economy of care) (2015)

Publisher: Secretaría de Política Económica y Planificación del Desarrollo
Website:
http://www.economia.gob.ar/peconomica/basehome/DT_09_uso-del-tiempo_03.pdf
Languages Available: Spanish

This book uses time use data from the 2013 INDEC survey in Argentina. The authors focus on the importance of considering unpaid productive work, particularly the care of children and adults in need of support, in economic and social policies. In addition to exploring the intricate dimensions of care of children and adults in Argentina, the paper also reviews the range of time use data collected in other Latin American countries.

Cornwell, B.
Social sequence analysis – Methods and applications (structural analysis in the social sciences) (2015)

Publisher: Cambridge University Press
ISBN: 978-1-107-50054-9
Languages Available: English

Benjamin Cornwell's sole authored exploration of sequence analysis follows the theoretical development of this family of techniques. Cornwell shows how network methods contribute to sequence analysis. He offers guidance on identifying sequence structures, and analysis of a range of social sequences and microsequences. Chapters 4 (identifying sequences) and 5 (comparing

whole sequences) make the most use of time use data as examples.

Damián, A.
El tiempo, la dimensión olvidada en los estudios de pobreza y bienestar (Time, the forgotten dimension in studies of poverty and wellbeing) (2014)

Publisher: El Colegio de México
ISSN: 978-6-074-62606-3
Website: https://goo.gl/4VcX8r
Languages Available: Spanish

This book explores time poverty in Mexico. The book opens with theoretical exploration of how the capitalist structure of the Mexican economy shapes the perceived value of free time. The book uses data from four surveys of Mexican time use, collected in 1996, 1998, 2002, and 2009. As a part of demonstrating the importance of measuring time poverty, the author develops an index of excess working time (ETT). The author also considers how gender struggles manifest in the experience of time poverty.

Draaisma, D.
The nostalgia factory – Memory, time and ageing (2014)

Publisher: Yale University Press
ISBN: 978-0-300-20539-8
Languages Available: English

This book explores how capacity to retain and recall memories alters as people age. The author includes an interview with fellow memory specialist Oliver Sacks. The book suggests that older people can find value in working with the tendency to reminisce. While not a time use research book in a conventional sense, the meanings and experience of time effuses many sections of discussion.

Hilling, H. and S. Watts
Dads behaving dadly – 67 truths, tears and triumphs of modern fatherhood (2014)

Publisher: Motivational Press, Inc.
ISBN: 978-1-628-65101-0
Website: http://dadsbehavingdadly.com/
Languages Available: English

This guide (written from a USA-based perspective) offers fathers tips to preserve – even enhance – their masculinity by participating in the ranges of childcare activities. This is not an academic tome, but the book does offer an insight into one application of time use research into care, unpaid domestic work, and promotion of gender equality. Many sections about specific care activities resonate with events recorded in time diaries.

Kalenkoski, C. M. and G. Foster
The economics of multitasking (2015)

Contributing Authors: Allard, M. D., Brown, J., Chaudhury, P., Craig, L., Foster, G., Hamrick, K. S., Kalenkoski, C. M., Sanchis, R. G., Stewart, J., Suziedelyte, A., and S. Wulff Pabilonia
Publisher: Palgrave Macmillan
ISBN: 978-1-137-38143-9
Languages Available: English

People regularly undertake more than one activity at the same time. While some combinations of activities might decrease productivity or impose mental strain from shifting focus, other combinations might enhance productivity or enhance concentration. This book addresses an oversight in the economic literature, which primarily ignores multi-tasked time. Some chapters in this book use the American Time Use Survey data, which collected a main activity only account of days, then added secondary child care, and more recently also secondary elder care, markers in main activity episodes. Some supplements additionally collect secondary eating within the framework of the main activity report of the day. Other chapters use surveys from multiple countries where people had the option of including secondary activity in their initial report of their day. This book explores the ways people report simultaneous activities, and examines what these reports of non-market activities, including study, eating, housework and child care, mean for policy analysis.

Nuryetty, M. T. and S. Nakayama
Time use survey in Jakarta, Indonesia (2015)

Editor: Midori Otake
Publisher: Tokyo Gakugei University Press
ISBN: 978-4-901-66536-0
Languages Available: Japanese, English

This volume offers the first overview in English of the Badan Pusat Statistik Republik Indonesia (BPS RI – the official statistical agency) 2004 pilot time use survey of all people aged 10 and older in households in five regions. This book additionally outlines patterns of daily activity in Indonesia, highlighting the unpaid contributions of women to the economic and social life of this country. Though slim, this book offers insight into a country with a culture seldom explored in the time use literature to this point.

Samantroy, E.
Reconciling work and family life – A study of women's time use patterns, unpaid work and workplace policies (2015)

Publisher: V.V. Giri National Labour Institute, Chandu Press
ISBN: 978-9-382-90230-0
Website: http://www.vvgnli.org/
Languages Available: English

This book explores work-life balance and working time arrangements in India, where women trying to reconcile unpaid and paid work responsibilities face stiff challenges. Time poverty, lack of care support services, and low family support for working women contribute to women's low labour force

participation. This publication aims to influence policies enabling more Indian women to take up paid employment.

Shipp, A. J. and Y. Fried
Time and work, Volume 1 – How time impacts individuals (2014)

ISBN: 978-1-848-72133-3

Time and work, Volume 2 – How time impacts groups, organizations and methodological choices (2014)

ISBN: 978-1-848-72134-0
Publisher: Psychology Press
Language Available: English

This pair of books adapts time use research techniques from the perspective of business management. The first volume considers how time shapes employees motivation, creativity, emotional well-being, sense of identity and stress. The second volume considers how time influences organisational dynamics.

Torriti, J.
Peak energy demand and demand side response (2015)

Publisher: Routledge
ISBN: 978-1-138-01625-5
Website: for 2016 paperback edition
https://www.routledge.com/products/9781138016255
Languages Available: English

This book addresses how the European Union might encourage households and businesses to use energy is a more efficient fashion to reduce the environmental impact of European energy consumption. The book draws on a range of data sources, including time use data. This text makes novel linkages of time use and smart meter information and gives insight into using time use data to measure the environmental impact of behaviours.

Wajcman, J.
Pressed for time – The acceleration of life in digital capitalism (2015)

Publisher: University of Chicago Press
ISBN: 978-0-226-19647-3
Languages Available: English

Wajcman mixes time use analysis and theoretical discussion of time literature to explore the increasingly hectic pace of life. Wajcman suggests that instead of creating time pressure, smart devices reflect the demand for higher tempo living people expect as a consequence of the prospects for increased efficiency offered by modern technologies. This book explores how technology has changed daily activity patterns.