

Experiences with the light-version time diary in Finland

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Abstract

Statistics Finland has conducted four nationally representative time use surveys with diaries filled in by respondents and later coded by the agency. The surveys have been conducted at intervals of approximately ten years. However, faster provision of data on changes in the use of time is needed, for example, for the calculations of the household satellite account. For this purpose, Statistics Finland has developed a light time diary, tested at its Survey Laboratory by means of the focus group interview procedure. The light diary comprises 35 pre-coded main activity categories as well as data on with whom time is spent. The diary served as a pilot survey conducted as a postal inquiry among a population of 1,000 persons in March 2010 at the same time as the time use survey was carried out by means of the full-scale diary. The aim of the pilot survey was to study whether results comparable with those of the full-scale diary can be produced with the light diary. The control data were data from the diaries kept in the full-scale time use survey in March. The same 35-category classification of activities as in the light diary data was formed for the control data. The presentation evaluates the effect of the data collection method on the response rate of the light-diary survey and the quality of the diary responses, and comparison is made on the estimates for time use obtained with the light diary and the full-scale diary.

Keywords: Time use survey, data collection mode, quality evaluation

1. Introduction

Statistics Finland has conducted four nationally representative time use surveys with diaries filled in by respondents and later coded by the agency. The surveys have been conducted at intervals of approximately ten years. The most recent survey dates back to 2009–2010 (Pääkkönen and Hanifi 2012). However, faster provision of data on changes in the use of time is needed, for example for the calculations of the household satellite account. For this purpose, Statistics Finland has developed a light diary, tested at its Survey Laboratory by means of the focus group interview procedure.

The diary served a pilot survey conducted as a postal inquiry among a population of 1,000 persons in March 2010 at the same time as the time use survey was carried out by means of the full-scale diary. The light diary comprises 35 pre-coded main activity categories as well as data on with whom time is spent. The aim is to study whether results comparable with those of the full-scale diary can be produced with the light diary. The comparisons in this paper are limited to main activities only.

2. Data

The light diary was tested with a sample of 1,000 persons in connection with the Finnish time use survey in 2010. The data collection took place by mail and the respondents

filled in the diary with 35 pre-coded activities. The persons kept the diary for one day. The age of the target persons was limited to between 25 and 64. There were two diary-keeping periods in March, each lasting one week. A reminder card was sent afterwards to all sampled persons.

The control data were data from the diaries kept in the full-scale time use survey in March. Only the same age group as in the light diary data was included in the control data. The same 35-category classification of activities as in the light diary data was formed for the control data.

3. Nonresponse

The nonresponse rate was 82.6 per cent and only 174 individuals from the sample returned the diary. Large nonresponse is harmful in two different ways: it reduces the sample size and thus increases the standard error of estimates and causes bias because the respondents differ from the nonrespondents. The nonresponse rates are often high in mail enquiries, and in addition, in this survey the respondents had to fill in the diary 24 hours, which increased the response burden.

The characteristics of nonresponse were studied using variables received from the sampling frame. The gender, age and education distributions of nonrespondents differed from the population (Pääkkönen and Väisänen 2012).

The nonresponse rate of men was seven per cent higher compared to that of women. The highest nonresponse of 91.4 per cent was among men aged 25–34, and the lowest nonresponse of 77.9 per cent was among women aged 55–64. The proportion of nonresponse was higher for lower educated persons than persons who had secondary or tertiary level education.

In spite of the high non-response, something could be retrieved by using the available auxiliary information. Post-stratification and generalised regression estimators can help to reduce the non-response bias. Post-stratification according age group and gender combined with calibration estimators were used for the light diary data. For a more detailed description of the weighting, see Pääkkönen and Väisänen (2012).

4. Classification of activities

A 35-category classification of main activities was used in the light diary. The order of the classification was hierarchical so that categories related to personal care were listed first, followed by gainful work and studying, travel, domestic work and eventually by free-time categories (Ås 1978).

The classification in the light diary was formed so that the 146-category activity classification used in the full-scale survey could be restored to it. The control data were classified by a corresponding 35-category classification for the comparison. Because of the low number of observations in the light diary data, a condensed, 15-category classification was made of the classification for the analysis (see Table 1).

The respondents were asked to record only one activity for each time slot. If the respondents were doing two things simultaneously, they were to select only the one they themselves regarded as the main activity. However, it became clear that this instruction was not heeded by everybody. The highest number of recorded simultaneous activities was three. At least two activities per episode were recorded in 79 per cent of the diaries. Thirty per cent of the respondents recorded three activities per episode. A total of 37 per cent had isolated empty episodes.

However, the vast majority (82%) of the episodes had only one activity. The share of episodes with two activities was 11 per cent and that of episodes with three activities four per cent. Three per cent of episodes had been left empty.

It was impossible to ascertain afterwards which of the simultaneous activities the respondents had viewed as the main one. The activities were entered in the order of the classification. Thus, if a diary contained several activities, the classification category with the shortest code number was always entered as the main activity, the one with the second shortest as the secondary activity and the one with the longest code number as the third activity.

To harmonise the definition of main activity with the full-scale time use survey, the following corrections were made to the data at the editing stage:

- 1) If *gainful work* was recorded as the secondary or third activity, it was changed into the main activity.
- 2) If *socialising* was recorded as the main activity and the second recorded activity was something else, the second activity was made the main activity.
- 3) If *resting* was recorded as the main activity and the second recorded activity was something else, the second activity was made the main activity.

No other changes were made to activities. After the changes had been made, durations were calculated for the main activity categories. The changing of gainful work from secondary or third activity to main activity increased the time used for it by 26 minutes. By contrast, the time used for meals and snacks decreased by 18 minutes in consequence of the made activity changes.¹

5. Results

Time use is here divided into the following main categories: personal care, gainful work and studying, domestic work, free time and travel. The two surveys produce quite

¹ In the Irish light diary survey (McGinnity et al. 2005), the respondents were able to record several simultaneous activities. However, they did not need to choose which one of them was the main activity. In the analysis, the problem was solved so that overlapping activities were also taken into consideration by forming "long days" of over 24 hours. The data were also assigned alternative priorities of activities when the length of the day was limited to 24 hours.

similar amounts of time for these main categories with the exception of domestic work on which the time spent is 33 minutes shorter in the light diary than in the control data (Table 1). The size of the difference is almost the same for men and women.

Table 1. Time used for main activities by type of diary and gender, minutes per day

| Activity | Total | | | Men | | | Women | | |
|----------------------------------|----------------|--------------|------------------------------|----------------|--------------|------------------------------|----------------|--------------|------------------------------|
| | Full-scale TUS | Light diary | Difference (TUS-Light diary) | Full-scale TUS | Light diary | Difference (TUS-Light diary) | Full-scale TUS | Light diary | Difference (TUS-Light diary) |
| Personal care, total | 630 | 624 | 6 | 627 | 621 | 6 | 633 | 628 | 5 |
| Sleep and resting | 502 | 483 | 19 | 503 | 493 | 10 | 500 | 474 | 26 |
| Meals and snacks | 80 | 90 | -10 | 80 | 88 | -8 | 79 | 92 | -13 |
| Washing, dressing | 48 | 51 | -3 | 43 | 40 | 3 | 53 | 62 | -9 |
| Gainful employment, study | 240 | 243 | -3 | 260 | 250 | 10 | 220 | 236 | -16 |
| Domestic work, total | 173 | 140 | 33 | 132 | 98 | 34 | 213 | 182 | 31 |
| Childcare | 25 | 17 | 8 | 13 | 7 | 6 | 38 | 28 | 10 |
| Other domestic work | 147 | 122 | 25 | 120 | 91 | 29 | 175 | 154 | 21 |
| Free time, total | 317 | 309 | 8 | 337 | 339 | -2 | 296 | 279 | 17 |
| Socialising | 43 | 67 | -24 | 48 | 64 | -16 | 37 | 69 | -32 |
| Participation and culture | 18 | 16 | 2 | 18 | 14 | 4 | 17 | 18 | -1 |
| Physical exercise | 42 | 30 | 12 | 47 | 26 | 21 | 37 | 35 | 2 |
| Computing | 31 | 30 | 1 | 29 | 36 | -7 | 33 | 24 | 9 |
| Reading | 35 | 44 | -9 | 32 | 44 | -12 | 38 | 44 | -6 |
| TV, video, radio | 130 | 106 | 24 | 141 | 135 | 6 | 119 | 76 | 43 |
| Other free time | 18 | 16 | 2 | 22 | 20 | 2 | 15 | 12 | 3 |
| Travel | 69 | 72 | -3 | 71 | 84 | -13 | 67 | 60 | 7 |
| Unspecified | 12 | 52 | -40 | 12 | 49 | -37 | 12 | 56 | -44 |
| Total | 1,440 | 1,440 | 0 | 1,440 | 1,440 | 0 | 1,440 | 1,440 | 0 |
| Diary days | 366 | 174 | | 173 | 70 | | 193 | 104 | |

Source: Statistics Finland

Sleep and resting were examined together as it seems that the respondents had difficulty in making a distinction between sleeping and resting (see also Lader, Short and Gershuny 2006). In time use classifications, sleeping usually comes under personal care and resting under free time (e.g. Eurostat 2009). The light diary produces less sleep and more resting than the full-scale diary. Even if the time spent on sleep and resting are added up, their sum is less than obtained with the full-scale diary. The light diary produces slightly more time for meals than the full-scale diary.

The two surveys produce almost equal total amounts of time spent on gainful employment and study. For gainful employment, the difference between them is only four per cent but for studying, the light diary produces almost four times as much time as the full-scale diary. It should be borne in mind that the age range of the survey respondents was 25 to 64, and the share of full-time students among them is small.

Among the main categories, the results of the two surveys deviate most in the time used for domestic work. The light diary produces 33 minutes less time for domestic work per day than the full-scale diary. There are differences particularly in the Home maintenance and Child care classes. The difference in the Home maintenance class might be explained by the low nonresponse rate of the light diary. A lower share of

those living in detached houses might explain the shorter time used for home maintenance. However, information on the type of housing among those responding to the light diary was not available. The amount of time used for renovations and repairs, which is an important category for the household satellite account of national accounts, is exactly the same in both datasets (eight minutes).

The light diary produces one-third less time for childcare than the full-scale diary in the entire dataset. When the examination is restricted to only those who have children aged under 18 living at home, the class Caring for children in the family is almost the same in both datasets (light diary data 45 minutes vs. control data 46 minutes). For the class Reading and playing with children the light diary produces only one half of the minutes of the full-scale diary (nine minutes vs. 19 minutes).

The total amount of free time only deviates by 2.5 per cent in the datasets. The most notable difference between the data can be seen in socialising: the light diary produces 56 per cent more time for it than the full-scale diary. It seems that the respondents have understood socialising in a way that differs from the coding practice in the time use survey. The light diary also produces one-quarter more time spent on reading. This only applies to the reading of books. It may be that the persons who were drawn as respondents to the light diary survey were active individuals who also read many books. Opposite differences can be seen in physical exercise as well as in watching television and listening to radio for the time used for them is shorter in the light diary data than in the full-scale diary data. The amount of time spent on computing is the same in both surveys.

Travel forms a single category in the light diary. The examples that were given were travel to work, school, shop, gym, or the like, also on foot. The time used for travel is almost the same in both diaries. The difference between them is only four per cent. In the comparison made in the UK, the light diary produced 14 minutes less travelling time than the full-scale diary (Gatenby 2003).

The diaries contained 13 minutes of unspecified time use and 39 minutes of empty episodes, totalling 3.6 per cent of the 1,440 minutes of the day. Missing data on sleep in the evening was imputed in the full-scale survey, which reduced time in the unknown category (see Väisänen 2012). In the control data, the time that remained in the unknown category was 12 minutes, or 0.8 per cent of the day.

6. Conclusions

Experiences gained from the testing of the light diary as a postal inquiry indicate that assistance from interviewers would be needed to reach a satisfactory response rate and to guarantee the quality of the filled in diaries. In this comparison, the effect of non-response was corrected with weighting.

Despite the high non-response, the diaries produced estimates that were close to each other at the main time use category level with the exception of domestic work. There are differences particularly in the classes Home maintenance and Child care. The high nonresponse rate may, however, have an impact on these differences. Separate distinction of the category of renovations and repairs that is important from the point of the satellite account of household production was possible.

Most respondents found it impossible to record time use by choosing just one main activity. Apart from main activities, the diary should also allow the recording of one parallel activity. The respondents themselves should be allowed to decide which is the main and which the secondary activity (see also McGinnity et al. 2005). The editing of the data to correspond with the full-scale survey data would then be easier in the categories of socialising, physical exercise and television watching.

The use of a web questionnaire could be tested as an alternative to a light paper diary. This could also improve the quality of the diaries.

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