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Framework for data collection on time-use: Relating objectives, design & resources

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A framework for data collection on time use: Relating objectives, design and resources.

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Introduction

Time use surveys may be conducted with the help of different methods. Typically time use researchers link their methodological perspective to diary based surveys. The way I see it, however, it is more correct to say that the methodological foundation of time use studies is records of *actual behaviour* as opposed to *estimates* of how much time that is spent on different activities (Harvey and Pentland 2000). Diaries may be the most common way of collecting this kind of records, but it can also be done by observations, interviews or other modes of data collection.

This definition frees time use surveys from the straitjacket of one particular data collection technique and rather links them to a methodological principle concerning how behavioural questions should be asked. Both theoretical arguments and empirical tests support that reports about actual activities are a better basis for statistics about activity patterns than questions asking for generalisations (Dex 1995).

Political priorities have always played an important role for the priority given to time use studies. Nowadays the plea from the 4th World Conference on Women in Beijing to improve data collection that describe the division of labour between men and women, and to quantify men and women's full contribution to the economy, stimulates the interest for time use studies. This kind of support is of course and important reference point for the design and classification systems of time use surveys. But I also think that the methodology of time use surveys needs a more general and scientific basis. What is on the political agenda will change. Time use surveys should be flexible, so that they can answer changing questions about people's activity patterns.

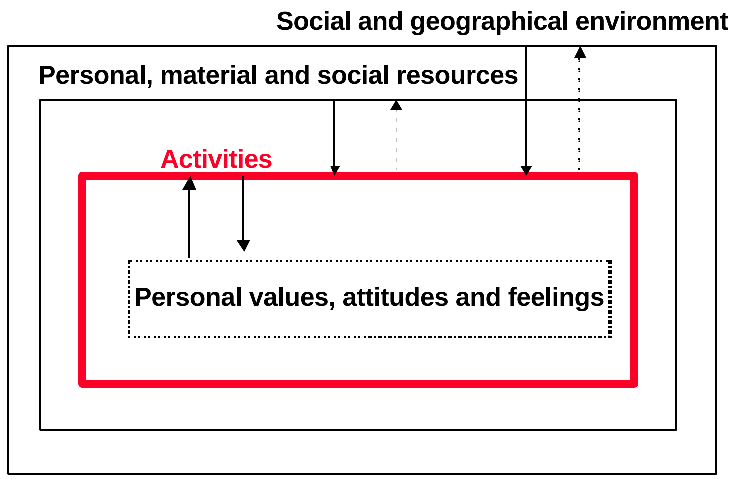
The core principles and guidelines should be governed by a sociological understanding of how the relationship between individual actions and social structures works. In the next passage I will present such a model. Next I will try to list the most important policy arguments that have been used to sell time use survey. This theoretical model and these popular policy argument should be the two sources that decide what *kind of information* that should be included in time use surveys.

After this discussion about the content of time use studies, I move to the question of how time use surveys should be designed. In this part of the paper, I will focus on how the quality can be enhanced and the response burden can be reduced in time use surveys. I think that some of the answers can be found in the design principles extracted from cognitive research and from the tailored design method advocated by Don Dillman and others working with mail surveys (Jenkins and Dillman 1997). I also think that we can draw some valuable lessons from our experiences with time use studies in developing countries. These considerations lead me to suggest a framework for the design and data collection procedure in time use studies. This framework applies first of all to time use surveys conducted by interviewers, but most of the elements are also important in self-administrated time use surveys. It is important to notice, however, that this framework is restricted to *the way the time use questions are presented to the respondent*. Guidelines for sampling, contact strategies, coding and other activities that take place before and after the time use data is collected fall outside the scope of this paper.

The causes and effects of people's actions

From an analytical point of view, people's actions is the crossroad where environmental conditions and personal sentiments meet. Our actions tell about how we adapt to our living conditions. At the same time they are a manifestation of personal values, attitudes and feelings. On the other hand, what we learn from our actions also affect what we value, believe and like. What we do also have impacts on our living conditions and environment. These two-way relationships between our actions and our surroundings and personality is illustrated in figure 1. To describe how these relationships really work is a demanding research program. But the first thing we can do is to make sure that the different pieces of the puzzle are collected in time use surveys. The participants of time use surveys first of all report about their activities. But the model also names other kinds of information we should try to capture.

Figure 1. The social and personal meanings of people's activities



The social and geographical environment
What people can do is both affected by their resources and by the social and geographical context they act within. The time they need to buy food is affected by the distance to the nearest grocery store and the transportation available. If they have their own car and plenty of money so they do not need to look for the cheapest offer, that will probably also have impact on their shopping activities. If you live in a town or have a big family there are more people to interact with than if you are single and live in a small place.

In order to understand how people spend their resources within the environment they live in, we obviously need background information about what resources they have at hand and what environment they act within. This information is usually collected in a traditional questionnaire before the activity registration starts. I think that one the reasons why these questions are asked before the real time use study starts is because researchers order questions in a "causes before effects" manner. If we are concerned about response burden and response rates, however, one general advice is that we should start with the most relevant and interesting questions. In a survey, which we announce that it is about peoples' daily activities, it may seem rather odd and disappointing that we spend the first hour asking traditional questions about the respondent's socio-economic status.

Questions about the respondents' social and geographical environment can often be decided without asking the respondents themselves, but rather collecting information from maps and local authorities. When several respondents from the same area are interviewed, I believe it is better that the interviewer measure the distance from different local facilities to the different respondents selected, than to ask each respondent to measure the distance from his home to local facilities. This is both because the response burden will decrease and because measurements made according to standard procedures probably will be more accurate than a number of amateur estimations.

Personal, material and social resources

The term personal resources refer to non-material skills and qualities like education and health. Material resources are concrete assets like money, cars, houses and household facilities. One's family, friends and work mates are all part of one's social resources. These headings are quite similar to the three dimensions of welfare that Erik Allardt wrote about in his book "Having, loving and being" (Allardt, E. 1975).

The relationships between personal resources and environmental variables one side and the activity patterns on the other are not always as easy to establish as it looks like in the model. Even if the resources and the environment of the respondent are mapped and measured in the background questionnaire, we need to know what resources that are at hand or where in the environment the respondent are in order to understand what activity options he have in specific situations. Phrased in methodological terms, we often need some mediating variables. The specification of location codes or codes indicating different modes of transport should be considered as such mediating variables. Let me give two simple examples. It is only when a person is at home that he or she can use the household facilities that are in the house. Thus it is also only at home that these facilities can affect the time spent on household activities. If we know that the respondent has travelled to his friend by bus and from there is going somewhere else, he can not use his car even if he owns one. In this last example the options can not be read directly from the diary, but is inferred from the sequence of travelling. It is possible that the location and travel codes used in time use surveys should be improved in a way that make it even easier to use them as mediating variables.

The respondents' health or education are something they carry with them, and is consequently resources that can always affect their activities. How much money that is to their disposal in different times and situation, however, can not be decided from what they earn. For this and some other material resources it may be a good idea to ask how much was available on the days covered by activity reports.

The presence of social resources can be measured in the separate social context column that we often find in time use surveys. Hence, in my mind the number of family members, the presence of some of these during the day and the social activities recorded all constitutes the respondent's social life. If one looks at the social context column from a resource perspective I think it becomes clear how important it is to record the presence of family members, friends and work mates in time use surveys.

Another even more difficult problem with the relationships between resources, context and activities is to show how different activities play back on individual resources and the respondents' environment. I will not discuss how this can be done empirically, but only point out that if time use studies should play an important role in social science, time series are indispensable.

Personal values, attitudes and feelings

Personal values attitudes and feelings can both be implemented in a causal and functional understanding of activities. In a causal model values and attitudes may have an effect on the way we behave. Or our attitudes to some questions may be coloured by the way we behave. In the Norwegian time studies for instance, it is interesting to see that attitudes towards the division of household actives among men and women do not match with the actual division of household work taking place.

If we apply a functional approach, the argument will be that activity patterns are established because we experience that some activities give us more pleasure than others. This kind of reasoning is what Robert Merton called causal feedback (Merton 1967).

Attitudinal questions are generally asked in the interview that goes prior or after the diary period. To establish data for a functional analysis, however, we need to link the activities and the feelings about them together. Ignace Glorieux and Mark Elcahrdus at the Free University of Brussels have tried to do just that. They have developed a typology of seven meanings that either can be considered as motivation for doing something or a way of evaluating activities (Glorieux and Elcahrdus 1999). The seven meanings were...

1. time devoted to the satisfaction of physiological needs
2. time for personal gratification
3. time spent as an obligation
4. time spent instrumentally
5. time spent as a matter of affect or out of solidarity
6. time spent to do one's duty
7. time spent to kill time

Based on this list, they posed seven statements about the motive and seven statements about the value of every activity recorded in their time use studies in 1984 and 1988. In 1999 this far too ambitious approach was reduced to one question with four response alternatives. The response categories were still based on the list of meanings. As long as the question is repeated for every activity, however, I still think it is a rather demanding design. I am also afraid that these repeating questions about motives may lead the respondents to come up with reasons for what they do that are not actually there.

As an alternative I have suggested to ask seven questions after each diary day has been completed. I call this kind of probing hindsight questions.

Figure 2: Hindsight questions about different kinds subjective experiences

In the list below we ask some questions about how you experienced the activities you have described in your diary. Please indicate if you recognise any of the experiences we ask about. And if so, also indicate with a letter in the diary for which activities this applies.

A	Was it any of the activities that you have reported that you would not have done had you not been obliged or forced to?	YES → NO ↓	Indicate with the letter A in the diary which activities this applies to
B	Have you reported any activities that you would rather not have done had it not been necessary in order to fulfil daily tasks?	YES → NO ↓	Indicate with the letter B in the diary which activities this applies to
C	Have you reported any activities that you could not skip without a feeling of bad consciousness?	YES → NO ↓	Indicate with the letter C in the diary which activities this applies to
D	Have you reported any activities that you just did because there was nothing else to do?	YES → NO ↓	Indicate with the letter D in the diary which activities this applies to
E	Did any of the activities you have reported lead to new social contacts or to better contact with people you already know?	YES → NO ↓	Indicate with the letter E in the diary which activities this applies to
F	Did any of the activities you have reported improve your health or sense of well being?	YES → NO ↓	Indicate with the letter F in the diary which activities this applies to
G	Did any of the activities you have reported leave you with a feeling of personal growth?	YES → NO ↓	Indicate with the letter G in the diary which activities this applies to

Each question in figure 2 is meant to cover one of the meanings by Glorieux and Elchardus. In this sequence, the respondent is not urged to attach a motive to each activity but rather asked to indicate if any of the activities had any of the suggested motives. One of the reasons why I present these questions here is also that the design shows a way of linking answers to activities specified in the diary. Even if one collapses the list of meanings into fewer alternatives, this reference technique may be used. In its simplest form we may just ask the respondent to indicate particularly positive or negative experiences with a plus and minus sign.

I hope to make a first test of this set of questions during the last two months of the time use survey presently running in Norway.

One important problem within the time use tradition that can be addressed with the help of this kind of subjective questions is *the difference between activities and events*. The activity records reported in time use surveys tend to imply that it is what you do that is important for your life and, hence, that doing little indicates a poor life. But even if the respondent does not report much activity, he or she may take part in highly meaningful events. One and the same activity may also have totally different meanings dependent of where and in which social context it takes place. In my opinion, questions about the meanings add colour and taste to the neutral reports of activities.

Popular social issues surveyed in time use studies

Time use surveys have been used to collect data about a wide array of policy questions and social issues. The purpose of this section is not to describe all these applications in detail, but to ask if any of the main issues studied with the help of time use surveys call for questions that are not yet included in the list of information elements. For this purpose I will concentrate my discussion on two of the most popular applications of time use surveys. Some other applications are also mentioned, but these are topics that may be analytically developed without any innovations in the survey instrument.

More direct measures and better analytical basis for labour force analysis.
The direct records of working activities in time use surveys measure working hours more correctly than estimates given in ordinary labour force surveys. Questions like "How much time do you spend on paid work on an average week-day" both requires that the respondent decide how an average should be estimated or calculated, and that he adds up the time spent on the relevant activities.

In addition time use surveys are not restricted to paid work or a restricted number of productive activities, but include all kinds of productive and non-productive activities. It is this broad picture that makes time use surveys so well suited for studies of the division of labour between men and women and other labour force studies.

Certain characteristic seem to typify much of the unpaid work. In many cases it tends to occur frequently, routinely and is done simultaneously with other activities. Even in time use surveys trivial every day activities are easier to miss out than activities which made the days different from others. Unfortunately, it is not the memorable events, but the ordinary way of living that we seek to capture in time use surveys. In order to pick up and decide when the daily routines are done, the respondent should be able to record more than one activity during the same time period. Thus it is common to give the respondents the possibility to specify at least two activities going on at the same time. In addition I will later in this paper consider different probing techniques that can help the respondent to remember when trivial and secondary activities took place.

Two extensions of the traditional time use format has also been proposed as means of collecting more valid information about paid and unpaid work. First the recall period may be extended in order to capture a picture of working patterns over a longer period than one or two days. In the Eurostat pilot surveys for instance, a week diary for recording working hours were tested (Eurostat 1999). In other surveys questions about how typical the reported working pattern are may be asked.

I prefer questions that are kept in a diary format, as the Eurostat question was. But whatever the format, I question the analytical perspective that is embedded in this kind of questions. The purpose of sampling and allocating diary days in time use surveys is to establish a data set that gives a representative picture the activities taking place in the society surveyed on different days, around the year. The analytical perspective behind this design is on sum of activities in different groups or in the society as a whole. The argument for questions about working patterns or other activities during a longer period of time, however, is that time use surveys also should give a correct picture of individual activity patterns. This may be a good idea if the sample of participants or days covered in the survey is small, but else I do not think it is a part of what should be the main approach in time use surveys.

The other extension is to recommend that more than one household member is included in the sample so that the true division of labour in families and intra-household dependencies can be studied (Eurostat 1999). This kind of analysis is first of all wanted in studies of families with small children. In most time use studies, however, the sample of family subgroups and the number of diaries that can be used for this purpose become too small. When more than one household member is asked to participate in the study it is also very likely that the nonresponse rate will increase.

More complete and comparable economic accounts

Traditional national economic accounts fail to include all nonmarket production. This causes serious problems both for comparisons of men and women's economic contributions in society and for comparisons between the economy of developed and developing countries. Because time use studies covers all kind of activities they have the potential of improving the accounts. The activity classifications used in time use studies were originally not tailored to fit with the distinction of economic and non-economic activities that is used in the calculation of national accounts. Hence, one of the main objectives of the international classification system proposed by the UN-expert group in 1997 was that it should be consistent with the conceptual framework of the System of National Accounts (SNA).

The activity classification system in time use studies may be regarded as response alternatives to questions about what the respondents have been doing during the day. When the classification system or response alternatives are changed the wording of the question typically also need to be revised. In order to make better accounts of productive activities I think we need new questions which identify economic activities that are not recognised as part of the market economy and which identify non-economic activities that nevertheless are productive.

Some of this information can be gathered from the activity descriptions without asking any additional questions. In the current South African time use survey one seek to capture the extra information needed about productive activities solely with the help of an extended classification system. Activities, which fall within the boundaries of the System of National Accounts, are divided into three categories: Employment for establishments, Primary production activities not for establishments and Services for income and other production of goods not for establishment. In addition community services and help to other households are distinguished from the management of one's own household and care for one's own household members in the classification system (Mpetsheni 1999)

The main weakness of this strategy is that we sometimes need a specification of for whom an activity was performed. Unless the respondent are probed for this specification we can not take for granted that he will give it. In order to identify activities that belong to the informal economy and distinguish these from productive, but non-economic activities, we also sometimes need to know if the activities were paid for or not (Harvey 1999).

A completely different strategy from the South African one was tested in the Eurostat pilot. In this diary a separate column was introduced. For every activity that the respondents described they were asked to tick off if it was done for others, or leave it blank if it was not. The test proved that this method was burdensome and did not work very well. In the final guidelines, questions about community services and help to other households are moved to the questionnaire accompanying the diary (Eurostat 1999).

One general point of view in this framework for data collection on time use is that questions about behaviour preferably should be linked to the concrete report that the respondent give in a diary or a recall interview. This is also a part of an effort to reduce the ordinary questionnaires used in time use surveys to a minimum. Consequently I am very sceptical to the Eurostat solution, which is to include a separate time use section in the individual questionnaire. What I think we should look for is a probing technique, which enable us to identify activities carried out for others without repeating the "for whom" question for all the activities the respondents report. This I believe can be achieved by using the same kind of hindsight questions that I have already suggested for questions about the respondents' subjective experiences in figure 2. In figure 3 four hindsight questions about payments and activities carried out for others are suggested.

Figure 3: Hindsight questions about payments and activities carried out for others .

1 **Did you or do you expect to receive any payment in cash or kind as a result of any of the activities you took part in yesterday?**

☐ YES → Indicate with the letter P in the diary which activities this applies to
☐ NO → Go to question 3

2 **Please estimate how much in total you earned from these activities**

☐ <currency>

3 **Were any of the activities you took part in unpaid services organised for the benefit of your local community or organised by any local association?**

☐ YES → Indicate with the letter U in the diary which activities this applies to
☐ NO ↓

4 **Were any of the activities you took part in unpaid help to persons outside your own household?**

☐ YES → Indicate with the letter H in the diary which activities this applies to
☐ NO ↓

The order of questions is important in this probing sequence. The reasoning behind it is that it is easier to remember paid activities than unpaid services and help to others, and that it is easier to calculate how much paid activities were worth after one has indicated which activities that generated an income.

There is also one general principle which should be recognised in this sequence. I have already signalled scepticism towards questions in time use surveys that is based on the idea that the results should tell the truth about the activity pattern of each participant. In my mind the analytical focus should be on the statistics generated from all the answers given. One possible objection to the questions proposed in figure 3 is that the respondent also may receive payment or help from other persons. As long as we only ask about the respondent's paid or unpaid contributions it is not possible to make up an individual balance of payment and expenses and of given and received services. This, however, is only true on the individual level. On a statistical level, these few, one-sided questions should be sufficient in order to estimate the flow of money and unpaid help and services in society.

A time use perspective on innovation processes and cultural change

Two central topics in the tradition of time use research have been...

- cross cultural comparisons and studies of social change
- studies of the behavioural effects of political programs, technological innovations and economic changes.

For both these topics comparable date from different populations and over time is the most essential element. I see no holes in the present time use instruments that need to be filled in order to improve these kinds of studies. On the contrary, for this purpose I would rather suggest less ambitious designs that focus on specific activities, but follow innovation processes more closely than what traditional time use surveys, launched every ten year or so, can do. One of the main objectives of innovation studies is to follow the dissemination and effects of new ideas or technology in different segments of the society. Because the ideas or technology is specified, the purpose or anticipated effects also are. Thus in this kind of time use studies we will normally focus on a narrow range of activities.

A slightly revised version of the simplified diary design suggested by Statistics Sweden may be applied in time use studies which focus on a narrow range of activities. In this diary the time periods are presented horizontally and a number of fixed activities are listed vertically. The list of activities are printed along the right and left margin at the inside of the cover page. Because the pages presenting different time periods is narrower than the cover page, the respondent can move from page to page without loosing sight of the activity list. The respondent specifies when he was engaged in different activities by drawing lines outside the relevant activities that indicates when the activities took place.

Figure 4: Design of simplified diary

	Time periods						Time periods						
Activities	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	**Activities**
1. Sleeping													1. Sleeping
2. Personal care													2. Personal care
3. Making food													3. Making food
4. Eating													4. Eating
5. Child care													5. Child care
6. Care of adults													6. Care of adults
7. Travelling													7. Traveling
8. Paid work													8. Paid work

In its present form, the ambition of this diary design is to cover all kinds of activities, but only at the first digit level. As I have pointed out earlier, however, the first digit of any time use classification system is the most abstract one. From a survey methodological standpoint it is therefore the least suitable basis for survey questions, which should be as concrete as possible (Haraldsen 1999). In studies of innovation processes and cultural change, on the other hand, we are generally interested in the effects of campaigns, new technology or imposed changes on specific activities. As long as the list is short it would thus be possible to use third digit activity descriptions, which are the most concrete, in the diary.

I doubt that a broad perspective on all kinds of activities and context information that we find in traditional time use surveys can be combined with frequent surveys that for instance pick up different phases in diffusion processes. Consequently, linking objectives to survey designs involves a discussion of weather it is completeness or time series that shall have first priority. I also think that social scientist tend to go for a complete model, while politicians and different kinds of social entrepreneurs are more concerned about specific changes over a shorter period of time. In my opinion, these two main objectives call for different time use survey designs.

In Norway the system for Level of living surveys consists of one panel who are asked the same basic questions each year and one annual survey which change topic from year to year. One year focus may be on peoples' housing conditions, the next year it may be on their health. Today the Time Use Survey, run every tenth year, is a part of this system. As an alternative the traditional time use surveys may serve as the core study in a survey program that also includes smaller time use surveys which focus on different subsets of activities in intermediate years. This would be a similar model to the system of level of living surveys. If the restricted, light version of time use surveys were linked to an omnibus, labour force or other regular survey, information about personal, material and social resources may already be covered in the original survey. Even if the scope of each of these time use surveys would be limited, such a design could open for rather advanced analyses. After some time they would also form a complete coverage of activities.

Changing qualitative questions into quantitative indicators
A general standpoint made in this paper is that it is the concrete records of the respondent's activities that should be in focus in time use surveys. One consequence of this standpoint is that I look for ways of reducing the length of the separate questionnaire that usually accompany the activity registration. I have already suggested that some of the information collected in this questionnaire could be gathered by interviewers or should be reformulated to questions linked to the diary. Here I will point at a third way of reducing the length of the separate questionnaire.

One of the social issues that have been surveyed in time use studies is the link between ways of living and the quality of life. I think it is a trend towards asking more and more questions about how stressing, boring, interesting or meaningful the respondents find their lives. The way I see it this kind of questions are often too general to be of any great value, and I would rather prefer direct evaluations of the activities reported in the diary, as I have already suggested in sequence presented in figure 3.

One of the basic principles in time use surveys is that it is not up to the respondents to decide what are labour or leisure activities. This is rather decided by some common definitions agreed upon by the academic society. I think that the same approach also may be applied in the construction of indicators of people's quality of life. Time use data is a rich source for indictor building. Instead of asking a lot of low valid questions about how people perceive their lives, I call for a development of quantitative indicators of quality aspects based on the time use data. In order to illustrate what kind of indicators that I look for, here are some very tentative suggestions:

- Stress could be defined on the basis of the number of activities within a certain period of time.
- The time spent on particular activities relative to the accessibility of those activities gives hints about interests and priorities
- Sociability may be measured looking at the relationship between the social context and social activities.
- A meaningful life may be a life filled with activities that fit with general attitudes about what should be the priorities in life.

The kinds and sources of information in time use surveys

So far I have tried to link general and more specific objectives in time use research to a list of what kind of information that should be collected in time use surveys. The result of this discussion is summarised in the first column of figure 5. At the same time I have discussed where in a time use survey design different kinds of questions should be asked. My main conclusion is that more questions should be linked to the activities reported and fewer questions should be asked in the separate background questionnaires. My suggestions for different sources of information in time use survey design form the second dimension of figure 5. When the kinds and sources of information is combined it results in a table of content for time use surveys.

Finally I have argued that time use research which focus more on diffusion processes than on giving a comprehensive picture of life styles, may be better served by a simple time use designs covering a restricted set of specified activities. If this set activities is changed from survey to survey they will cover the whole range of activities within a given period of time

Figure 5 List of information and sources of information in time use surveys.

	Source of information			
Kind of information	**Externally collected information**	**Separate questionnaire**	**Diary/ Recall interview**	**Questions linked to the activity records**
Social environment	X			
Geographical environment	X			
Personal resources		X		
Material resources		X		
Social resources		X		
Main activities			X	
Simultaneous activities			X	
Personal values and attitudes		X		
Personal feelings				X
Payments				X
Unpaid services				X
The quality of life			X	x

Combinations of time use approaches and data collection modes

Two methodological approaches are common in time use surveys. The first is to ask the respondent to log their activities throughout the day in a diary divided into fixed time intervals. After ten minutes intervals was recommended in the Eurostat guidelines, this seems to be the future standard length of the intervals. The other main method is to conduct a recall interview about yesterdays activities. While the diary starts with the time intervals and ask what activities that took place within each of them, the interviewer normally first ask about activities and then when they started and ended. Hence, diary records may be called *time driven*, while the interviews are *activity driven.*

Up till now empirical research has not shown big differences in results when these two methods are compared (Lingsom 1979). Recall interviews along with starting and stopping times have the potential of picking up more details. On the other hand it seems easier to record secondary activities and the social and geographical context of activities in the diary format. This seems to be particularly difficult in interviews when secondary activities and changing settings follow a different time schedule than the main activities. While recall interviews therefore may be the most appropriate method in order to pick up details in the main chain of activities, the diary seems to be a better way of recording parallel chains of activities and settings during the day. The strengths and weaknesses of the two methods may be compared with looking at the society with a magnifying glass or with a wide angle lens.

Another rather important difference is that diaries with activities presented in the same fixed time interval format may be more suitable for comparative research than results from interviews with open time intervals.

The most serious argument against time driven diaries is that, even if we plan our day according to the clock, what we later remember from that day is generally not recorded in our mind with time stamps. Cognitive research has concluded that people find it easier to remember *what* happened than to remember *when* it happened (Tanur 1992). Aided recall techniques used in interviews therefore first ask what activities took place, and then tries to locate them in time. In diaries, on the other hand, the order of questions does not fit with the way people generally recall previous activities. This does not need to be a big problem when the diary is handed to the respondents before the day when it is supposed to be filled in. When this is done the respondent can prepare himself for a time driven perspective on this particular day. If he is to fill in the information by his own, he may even carry the diary with him and record the activities as they occur.

A diary that is handed out and filled in by the respondents on predestined days also seems to be is a fairly straightforward procedure to follow by people who can read and write and who run their day by the clock. In societies or part of societies were a large proportion of the population are illiterate and do not wear a clock, however, it may be more difficult to collect time use data with the help of self administrated diaries. Here, interview techniques may be easier to use.

The problem of translating what people recall into a time use format

The first national time use survey in South Africa is conducted this year. The data capture was done by personal interviewing about the previous day's activities. The answers given were recorded in a diary with fixed half-an-hour intervals. Hence, this may be called a hybrid of recall interview and diary registration. The interviewers also coded the activities. Simultaneous activities and the location or travel mode were recorded, but not the social context of the activities. I was given the opportunity to take part in the interviewer training and to monitor some of the field work in the Western Cape province. Generally I was impressed by the quality of work done by the local interviewers. Nevertheless I want to highlight one general problem which I have reasons to believe you will also find in more traditional recall interviews.

As expected the respondent found it easier to report what they had done then when it happened. But our initial fear that the respondents would have great problems with specifying the time, seemed to be exaggerated. There is a correlation between the number of activities people are engaged in and their time awareness. Even if they do not have a clock, people who have a busy life pick up the time from radio or television programmes, regular events or other sources. On the other hand, those who had a low time awareness neither had many activities to report.

The most demanding part of the interviewer's job was not the low time awareness of the respondents. It was to translate what the respondents told them into the diary format. Most respondents tended to tell what they did at different times rather than what they were occupied with during different intervals. From this way of reporting, the interviewer had to deduce which activities took up the different time intervals. One of the problems which arouse when the interviewer simply wrote down what the respondents told her, was that they reported minor incidents as the only activity that took place within a ½ hour interval. In particular this often happened in the period just before or just after a period with long lasting activities. In these periods' minor activities like taking a pill, laying the table, parking the car or going to the toilet often were the only activity reported. From the next interval, however, you could read that these incidents were enveloped in more lasting activities, like sleeping, working or eating.

In addition to this translation task the interviewer she should also indicate if different activities took place at the same time and record the location codes for each activity. Apparently this was often too much to handle during the interview. Because of this, location codes and "same time" indications were typically not filled in during the interview, but completed afterwards (Haraldsen, Vaage and Asi 2000).

This kind of problems are not unique to recall interviews conducted in developing countries. From some cognitive interviews conducted as a part of the development of an American time use survey, the Bureau of Labor Statistics reports that temporal information about routine and daily activities are rarely stored for very long. The participants in the tests found it easier to report the duration of events than when the events started and ended. It also seems that most temporal information is encoded by linking activities to recurrent patterns in one's environment or to phases of events rather than with an precise time stamps (Stinson 2000).

The American time use study is planned to be carried out as an activity driven recall interview, conducted by a centralised staff of CATI-interviewers. They way people store their memories about past activities seem to cause the same "translation" problems in this kind of interviews as in diary based interviews in South Africa. To ask for the time when activities started and ended also seem to ask for more precise time specifications than to report what activities that took place within a time interval. Thus I still believe that an interview administrated diary with fixed time intervals is the best procedure in developing countries. I also think that this standard format is the most reliable starting point for international comparisons and comparable time series. What the South African experience show, however, is a simple copy a diary design meant for tomorrow registration, does not work satisfactory as a basis for recall interviews.

From a two diary approach to a three *step* diary approach

In the Palestine and South African time use surveys a data collection procedure with two diaries was suggested. The first one should be a simple version of the main instrument which could be left by the respondents at the interviewer's first visit. In this version eight groups of activities were indicated by pictograms at the heading of the activity registration column. These pictograms referred to main activity categories. Under the different pictograms the respondent could either write down or indicate in other ways the activities that had taken place. In addition he was asked to indicate if the activities involved travelling or not and if the respondent were alone or together with others. This alternatives were also presented with pictograms. So was also the first and last 15-minute period of each hours. A draft version of such a diary is shown in appendix 1.

The idea behind this diary was that both literate and illiterate respondents should be able to fill in some activities before the interviewer came back on a second visit. This should both help the respondents to remember and the interviewer to complete the real diary in an efficient and reliable way.

The pictogram diary has not yet been tested, but in the South African time use pilot the respondents were given a copy of the diary and encouraged to make their own notes between the first and second visit. The notes the respondents made in this diary were meant to form a basis for the second day diary. As it turned out, however, the response rate dropped drastically between the first and second visit. The main reason seemed to be that a positive attitude towards the survey changed as the respondent experienced how long and detailed the questionnaire were. The second visit was regarded as doing the same thing even one more time. Those who had already specified activities on their own, were willing to participate but unwilling to go through a second interview. They preferred just to hand over their notes. The result of the pilot was that only one diary day was covered in the South African time use survey. Hence, the combination of an self-administrated diary and a diary filled in by interviewers was also dropped.

The best way of conducting time use surveys among people who can not read and write is obviously by interviewing. For several reason I also prefer that the time use information is recorded in a fixed interval diary format. As already written, the biggest challenge for the interviewers in South Africa was not the respondents did not know the clock, but that they reported their doings in a way that can not be directly written into the diary. The same kind of problem is recognised in time use interviews conducted in developed countries. The respondents report events rather than activities and the duration of activities rather than the starting and ending times. In order to address this problem I suggest a two step procedure that distinguish between a record of the activities as the respondent present them and the registration of activities into a proper time use diary. The idea behind this procedure is simple. By splitting the job into two, we make the interviewer's job easier and more reliable.

In appendix 2 and 3 I have drafted two questionnaires. The first is called an Activity list and the second a Time use diary. Both should be used by the interviewer *at one and the same* visit or telephone interview. They are tools in the first two steps in a three step data collection procedure.

The first step is an open invitation to the respondent to report yesterdays activities as he remembers them. The registration form follows an activity driven procedure. The respondent is first asked to name activities and then asked if he also can tell when they took place and how long they lasted. The ideas are...

- to start with the activities that first come to the respondent's mind
- to record these in a format that conforms with the way the respondent tell about yesterdays activities
- and to establish time markers that can be use to fill in the gaps in the second phase of the interview.

After the activity list is completed the interviewer move to the time use diary. In the activity list she already has a drafted script of what activities the respondent took part in. The second step is to transfer this information into a diary format and to probe for activities that took place before, after and at the same time as those already mentioned. In addition the social context, location and modes of travelling should be specified. In this phase the interviewer takes a time driven approach. The task is to establish four continuous strings activities and activity settings. Hence the diary is filled in column by column.

Along the right margin of the time use diary there are five columns for codes. The first four refer to the four questions asked in the diary. The fifth is for codes given as answers to hindsight questions posed after the diary is completed.

Design principles

In the self-administered surveys, a user friendly design has been regarded as one strategy of reducing the response burden (Yammarino et al 1991). I have previously argued that design principles that have proved to reduce the response burden in ordinary mail questionnaires also should be considered as a way of improving the design of the current time use diaries. This may have a positive effect both on the response rate, which is disturbingly low in many countries, and on the data quality. Even if it is interviewers who administer the diary in developing countries like South Africa, there also seem to be a need to reduce their burden.

Jenkins and Dillman summarise what is known of how good questionnaires should look like in two navigational guidelines and three principles for information organisation (Jenkins and Dillman 1997). The two navigational guidelines are that...

- the use of visual elements should be used in a consistent manner to define the desired navigational path that the respondents should follow
- When established format conventions change in the middle of a questionnaire, visual guides should be used to redirect respondents.

The most serious navigational weakness in time use diaries is that it is not indicated if each activities and context information should be specified line by line, or if all main activities should be filled in first, followed by secondary activities and the social and geographical context of the activities. This lack of navigational guidelines is created by the absence of question numbering, the presence of a lot of horizontal and vertical lines that only divide the diary page into independent cells and response boxes that neither form lines nor columns.

The three principles for information organisation according to Jenkins and Dillman are...

- Place directions where they are to be used and where they can be seen
- Present information in a manner that does not require respondents to connect information from separate locations in order to comprehend it.

- Ask people to answer one question at a time

The forms suggested in appendix 2 and 3 are only drafts and probably far from perfect. But they are nevertheless an attempt to apply these navigational and information organisation principles in time use instruments. The combination of numbers and visual separation of lines or columns communicates the order of questions and tasks. The white question numbers on black background serves as navigational landmarks for the reader.

The activity list starts with a stepwise introduction to how the rest of the table below question 4 should be filled in. In this way the line by line procedure is established. This procedure is also visualised by the shaded space between each registration line. In the time use form it is the column and not the lines that are kept apart.

Secondary activities are traditionally recorded by a question with overlapping response categories in time use survey. The respondents are simply asked to fill in secondary activities if they took place, or leave the space open if he or she has nothing to report. The problem with such a format is that a blank line may either mean that secondary activities were not filled in or that secondary activities did not take place. To separate between these two possibilities, a box for no secondary activities is provided.

The same combination of response box and line to fill in information has been used in the location and travel columns. In the location column the idea is that we should at least be able to distinguish between activities which took place at home and at other places. In the travel column the box and line format is chosen because walking generally is not considered as a way of travelling, and therefore often is missed out.

In both forms the questions are distinguished typographically from response alternatives.

Context based probing

The most important probe during the completion of the time use diary should be to make sure that there are no logical gaps in the sequence of events. Before the respondents go for breakfast they do not only need to stay out of bed, but also to dress. After preparing a meal, most of us eat. When the respondent change location there must be some kind of travelling in between. By probing for this kind of logical relationships, routine activities that are often missed should be picked up.

After the diary is completed I recommend that the interviewer tries to pick up even more details by checking the relationship between activities, the social context and the locations or modes of travel by questions like...

- During the period from 9 to 10 you reported that you were alone and were preparing and eating a meal. Can you remember any other activities from this period?
- Is it correct that the rest of the family did not turn up before after you have finished the meal
- What was the purpose of the half an hour bus trip you made just after 12 o'clock?
- While on the bus did you do anything else than reading the paper?
- Even if your son were present from 6 to 8 o'clock in the evening you have not reported that you were doing anything together. Is that correct?
- When you socialised with your friends from 8 to 10 in the evening, was talking and eating the only activity you took part in?

Events stored within the respondents' memories may be represented by several different retrieval cues such as location or memories about who were present. Consequently probes based on the location or the social situation may pick up previously overlooked information. This final probes, which I call context based probing, constitutes the third step in the diary approach I have described here.

There are other probing techniques at hand also. One that was used in South Africa was to probe for child care not spontaneously mentioned during the completion of the diary. Another is to list often forgotten activities. These methods are called targeted and checklist probing. I am sceptical to this kind of probes because asking for specific or presenting a selective list of activities may lead to biased results. I also think that it is an advantage for the interviewer that he is trained in a few techniques and clearly instructed when to use them. Unbiased probing is difficult and should not be an open option to the interviewer.

Cost and quality of frameworks for data collection on time use

High quality generally cost quite a lot of money. But contrary to what commercials often try to convince us, high prices are not a guarantee of high quality. The framework for data collection that I have presented here is guided by high quality standards combined with an effort to restrict myself to the core questions of time use surveys. In my opinion, one of the reason why time use studies often are expensive, is that we include a lot of questions that rather belongs to level of living and consumer expenditure surveys. I have also argued that a clearer focus on statistical analysis's can save us from asking expensive questions that aims to capture what is the typical activity pattern for the individual participants and their households.

My second contribution to cost effectiveness of time use surveys is my suggestions for improvements in the data collection procedure and instruments. In my mind the elements and basic order of activities in time use surveys should be:

1. Externally collected information about the social and geographical environment of the respondent. The respondents should not be burdened with this kind of questions.
2. Household roster questions. The number of questions asked before the time use registration starts should be kept to a minimum. However, the person selected for the survey and specification of household members in social context column of the diary may be based on the composition of the household. Because of this the household roster need to be filled in before the diary.
3. Spontaneously remembered events and activities recorded in an activity list
4. Time use diary filled on the basis of the activity list and context based probing
5. Hindsight questions about personal feelings, payments and unpaid services
6. Individual questionnaire about resources

This procedure is first of all tailored for interview surveys. In most developing countries I do not think it is possible to carry out good time use surveys without the help of interviewers. But I think it is possible to restrict the number of visits by the interviewer to one.

In ordinary self administrated time use surveys it does not seem to be a need for an activity list. But I can see one possible use for this list in this kind of surveys too. Self administrated time use surveys often have a very high nonresponse rate. One of the reasons is presumably that the response burden of filling in a full diary is high. For those who refuse to participate of this reason an alternative could be to offer them an activity list that they can fill in. After this is done an interviewer may come to transfer the information given into the proper time use diary. In this way we offer a mixed mode design that move some of the burden from respondents to one of our interviewers when that is needed.

My third contribution to cost effective time use surveys is to suggest that time use data is captured by a combination of a few comprehensive surveys and some more frequent surveys that cover a restricted number of activities that adds up to a complete set of activity registrations after some years. For this purpose a simpler diary design is suggested. If these smaller diary surveys are linked to omnibuses or other regular surveys the external information, the composition of the household and the individual resources will normally be covered and paid for by the "mother survey". Taken into account that such a mixture of surveys both will cover the long and short trends in how people live their lives, I think it must be characterised as a cost efficient survey programme.

Finally there are also other ways of reducing the cost of time use surveys that I will only mention briefly.

Sampling diary days
One of the main reasons why time use surveys are expensive, is that we do not only aim for a representative sample of participants, but also a representative sample of diary days. The most expensive solution to this problem is to include all days instead of picking a sample. A cheaper alternative is to chose some periods which are believed to represent different seasons. Even if sampling is not my profession, it strikes me that a survey which cover all days may be compared with a census. Hence, it might be a good idea to design sample frames of diary days in a similar way as we use census data to construct sample frames of people.

Tailored contact strategies
It is well known that the survey response rate is heavily dependent of how much effort and what strategies we use to come into contact with the sampled persons and to persuade them to participate in the survey. In his latest book, Don Dillman recommends a five step contact strategy and stresses the importance of using different communication channels and arguments in each step (Dillman 2000). This kind of administrative aspects should obviously be a part of a framework for data collection on time use, but would exceed the framework of this paper.

Computer assistance
Computer assisted interviewing can assist the interviewer in many ways. The computer programme can lead the interviewer through the flow of questions, execute continuous quality controls and suggest probes and construct new questions on the basis of answers already given. I will not go into details about all these possibilities. But I will like to point out that these features probably could be built into a computerised version the three step procedure for time use data collection described in this paper.

Coding in the field
Coding is one of the expensive and time consuming tasks in time use surveys. Traditionally this has been done by specially trained personnel in the central statistical office. But the South African experience seems to support that it can just as well be done by the interviewers during the field period. If that is right, it will both save time and money. In addition it is also makes it easier to collect extra information in cases when the original activity specification is so unclear that it is difficult to code.

References

Allardt, E.(1975): *Having, loving and being. Social Welfare in the Nordic Countries.* Lund: Argos

Dex, S. (1995): *The Reliability of Recall Data: A Literature Review*. I Bulletin de Methodologie Sociologique, 49, pp 58 - 89.

Dillman, D. A. (2000): *Mail and Internet Surveys. The Tailored Design Method.* New York: Wiley

Eurostat (1999): Guidelines on Harmonised European Time Use Surveys.

Glorieux, I. and Elchardus, M. (1999): *What does your time mean? Some arguments for including indicators on the meaning of time use in time budget research.* Paper presented at the 1999 IATUR Conference "The State of the Time Use Research at the End of the Century". University of Essex, Colchester, UK 6.-8. October

Haraldsen, G (1999): *Survey Methodology - A Recipe Approach.* Oslo Gyldendal AdNotam

Haraldsen, G., Vaage, O and Asi, S (2000): Time Use Mission Reports from Palestine and South Africa. Paper presented at 2000 IATUR Conference in Belo Horizonte, Brasil 7.- 9. June.

Harvey, A. S. and Pentland, W. E. (2000): *Time Use Research.* In Pentland, W. E. et al (ed): *Time Use Research in the Social Sciences.* New York: Kluwer Academic/ Plenum Publishers

Harvey, A. S. (1995): *Economic Framework for a Categorization of Activities.* Unpublished

Jenkins, C. R. og Dillman, D. A. (1997) *Towards a Theory of Self-Administered Questionnaire Design* I Lyberg, L et al. (red): *Survey Measurement and Process Quality.* New York: Wiley, 1997.

Lingsom, S. (1979): *Advantages and disadvantages of alternative time diary.* Oslo: Working paper

Merton, R. K. (1967): *On Theoretical Sociology.* London: Macmillan Publ.

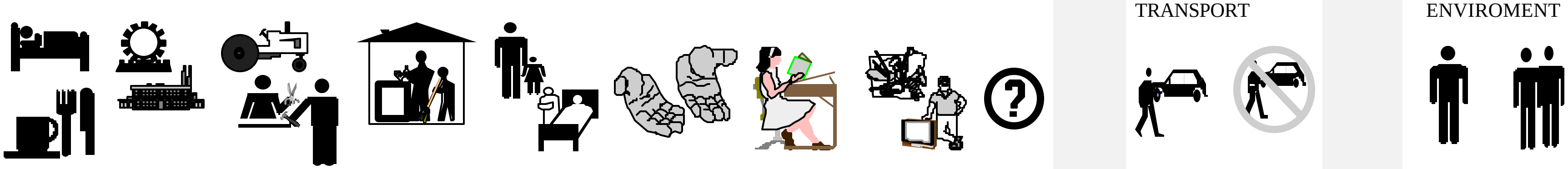
Mpetsheni, Y (1999): Dealing with Diversity. Measuring Time Use in South Africa. Paper presented at the 1999 IATUR Conference "The State of the Time Use Research at the End of the Century". University of Essex, Colchester, UK 6.-8. October

Stinson, L. (2000): Using a Time Use Approach to Measure the Frequency and Duration of Non-market Labor. Problems and Solutions. Washington, Bureau of Labor Statistics.

Tanur, J. (ed) (1992): Questions about Questions. New York: Wiley

F.J. Yammarino (1991): "Understanding Mail Survey Response Behaviour: A Meta Analysis" *Public Opinion Quarterly* 55,4: 613-639

Appendix 1 Pictogram diary



	1. ACTIVITIES										2. LOCATION & TRANSPORT			3. SOCIAL ENVIROMENT		
	PERSONAL CARE	EMPLOY- MENT	OTHER PRODUCTION	MAINTAIN OWN HOUSHOLD	CARE FOR OWN FAMILY	HELPING COMMUNITY AND OTHERS	LEARNING	SOSIAL CULTURAL LEISURE	OTHER	CODE 1	MOVING	STAYING	CODE 2	ALONE	WITH OTHERS	CODE 3
0600-0615																
0615-0630																
0630-0645																
0645-0700																
0700-0715																
0715-0730																
0730-0745																
0745-0800																

Appendix 2

Activity list **Date: _____** **Month: _____** **Time started: _____**

1 What is the first thing you remember doing yesterday morning?

2 At what time did this happen?

3 How long did this activity last?

	Time: ___:____ ☐ **Don't know**	**Minutes: _______** ☐ **Don't know**

4 What else were you doing this day? **Name all the activities you can remember and try to specify when the happened and how long they lasted.**

Activities	Points of time	Duration
	Time: ___:____ ☐ **Don't know**	**Minutes: _______** ☐ **Don't know**
	Time: ___:____ ☐ **Don't know**	**Minutes: _______** ☐ **Don't know**
	Time: ___:____ ☐ **Don't know**	**Minutes: _______** ☐ **Don't know**

Appendix 3

Time use diary Date: _____ Month: _____ Time started: _____

Time	1 What were the respondent main activity during the periods listed below?	2 What else were the respondent doing in the same period? Indicate none	...or specify what	3 Were the respondent alone or with somebody he or she know? Alone	with household members: Spouse	_____	_____	___	With... relatives	others	4 Were where the respondent located or in what way did he or she travel? At home	Elsewhere	Walking	Other mode of travelling	CODES 1	2	3	4	5
0700-0710		☐		☐	☐	☐	☐	☐	☐	☐	☐	________	☐	________					
0710-0720		☐		☐	☐	☐	☐	☐	☐	☐	☐	________	☐	________					
0720-0730		☐		☐	☐	☐	☐	☐	☐	☐	☐	________	☐	________					