

Conditions of Work and Employment Programme

***Statistics on working time arrangements
based on time-use survey data***

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Preface

Working time has great implications for the quality of working life as well as enterprise performance. Both hours of work and the different patterns in which these hours are arranged have an important influence on a range of terms and conditions of work. For example, the number of hours that people work directly affects their compensation; not only their earnings but also their non-wage benefits, such as paid leave, pensions and even their access to social protection. The number of hours worked and when those hours are worked also has clear implications on matters as diverse as workers' health and safety and their ability to balance work with their family responsibilities. And from the perspective of enterprises, there is a clear link between working time, job satisfaction and productivity.

Recent changes in working time towards greater flexibility indicate that the "standard" workweek is less and less the norm. Various innovative working time patterns, such as hours calculated on an annual basis, flexitime, compressed workweeks, on-call work and teleworking are gradually increasing. However, it is often difficult to capture recent changes in working time patterns by relying on standard statistical methods or instruments. It is against this background that the ILO's Conditions of Work Branch, in collaboration with the ILO Bureau of Statistics, is studying whether and how the current statistical methods can be improved to better capture developments in working time arrangements, and what types of alternative instruments can be utilized for this purpose.

This study focuses on one important alternative instrument for measuring today's working time arrangements: time-use or "time diary" studies, which provide a detailed breakdown of working time hour-by-hour and day-by-day. It uses microdata obtained from time-use studies to create a classification of working time arrangements and then analyses how daily work patterns are organized in four countries: Canada, the Netherlands, Norway and Sweden. The results of the study offer some important insights into the potential advantages and disadvantages of time-use data for obtaining a better understanding of those working time arrangements which are emerging.

A companion paper to this working paper, prepared by Bell and Elias,¹ offers a different perspective on how current statistical methods can be improved to better capture developments in working time arrangements. It is hoped that these two papers, taken together, will contribute to the improvement of current working time statistics and the development of new methods of providing improved information sources to assess the impacts of changing working time on workers' well being.

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¹ D. Bell and P. Elias: *The definition, classification and measurement of working time arrangements*, Conditions of Work and Employment Series No. 4 (Geneva, ILO, 2003).

Executive summary

- The purpose of this study has been to analyse daily schedules of work time patterns of individuals residing in four countries of the western hemisphere: Canada (1992), the Netherlands (1990 and 1995), Norway (1980 and 1990) and Sweden (1991). Effects of demographic differences such as gender, age, marital status and age of the youngest child on work time patterns are also assessed. Where possible, the analysis has also been extended to cover variations over time and over different labour market characteristics of individuals.
- The analysis is based upon micro-data obtained from time-use surveys. The survey collected data on the time-use patterns of respondents who were asked to maintain full records of their daily activities in diaries.
- Work was defined as all paid work encompassing regular paid work, overtime work and work at a second job. Work episodes were defined as single occurrences of paid work activity separated by 60 or more minutes from any other paid work episodes. The reference work episode was the one that occurred during “core” hours, which were defined as 8:00 a.m. to 6:00 p.m. for Canada and the Netherlands and 7:00 a.m. to 4:00 p.m. for Norway and Sweden. These “core” time definitions were based upon the frequencies of start and end-times of work episodes. Work episodes were calculated for all days, including weekend days. In Canada 1992, 12.6 per cent of male and 10.3 per cent of female work arrangements were on weekends. Core hours dominated weekend arrangements.
- The above definitions of work, work episodes and core time resulted in identification of seven theoretical work time arrangements possible during a day for each individual with reference to the core working hours. These classifications of work time arrangements extend from early morning to late night with three classifications being single arrangements and four being multiple and overlapping arrangements. Empirically these arrangements, in combination, generated ten working day patterns for individuals. These were explored across the several studies.
- Results indicate vast, though as yet statistically untested, differences in work time arrangements across countries and by sex. In general, men tend to be more evenly distributed over the work time arrangements defined for a typical day than do women. Women tend to be more concentrated in a single core-only arrangement, while more men are more evenly distributed over the possible work time arrangements.
- Among men, Canadians and Swedes distribute their work time over a larger span of the day, with around one-third only working during core hours. Dutch and Norwegian men, in contrast, are more likely to stick to core hours, with nearly half of these men working only during core hours.
- Swedish women work over a much wider range of hours in the day than women in the other countries.
- The above results also held when the analysis was extended to more than one period (for the Netherlands and Norway). In Norway, there was a slight tendency for arrangements to extend toward the post core hours. This may reflect changed store opening hours. In contrast, in the Netherlands the tendency was toward a core-only working arrangement.
- For the Netherlands, on all the seven days of the week core work time was dominant.

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- The Norwegian data permitted analysis for various occupational categories during 1980. Skilled and unskilled manual workers tend to start their work activities earlier in the day (before or during core hours) than professionals, managers and white-collar workers.
 - Swedish and Canadian data also permitted analysis for various job tenure characteristics. In Sweden, part-time workers were found to be more heavily concentrated in core hours than were full-time workers. Self-employed Swedish workers primarily worked during core and post-core hours, while their Canadian counterparts were more likely to work during core hours only. Nevertheless, Canadian self-employed workers also had a more even distribution across the categories of work spanning non-core hours or entirely outside core hours.
 - Canadian data permitted analysis by further labour market characteristics such as union membership, type of work (on-call, not on-call), compressed week, types of work shifts (day, evening, night, split and rotating) and flexible schedules. Workers working a compressed week were less likely than other workers to work core only hours. Not surprisingly, daytime workers start and finish earlier than the evening and night time workers. Workers working split and rotating shifts were more evenly distributed over work time arrangements than those with day, evening and night shifts only.
 - Union members were less likely to work core only hours and more likely to start earlier in the day.
 - On-call workers are more evenly distributed over work time arrangements.
 - Working time arrangements are strongly related to the duration of paid work. The longest hours are put in by persons with "pre-to-core" and "core-to-post" work episodes. Persons working post only, or core-to-post put in the fewest hours of paid work.
 - The data suggest a weakness in using respondent-estimated hours for analytical purposes. Calculated weekly hours varied considerably by work arrangement while respondent-estimated weekly hours did not. This suggests that varied work arrangements impinge on respondents' ability to accurately recall actual work.
 - The work presented here shows that time use data can provide considerable insight into working time arrangements. It also highlights the need for some basic work on establishing criteria to define core hours and related work patterns in a manner that will be meaningful for labour.

Background

Increasingly workers and employers are opting for new more flexible work time arrangements. As established standard work routines give way to more varied and innovative work patterns, it will become increasingly difficult to monitor working conditions and establish standards. Emerging patterns cut across a broad range of conditions related to job tenure and daily, weekly or seasonal variation. In order to understand the impact of such changes, it is necessary to measure and monitor patterns of work time.² Time-use studies potentially provide the ideal means for doing so, since they capture the actual – rather than normative – work routine of a society. This report begins to explore the usefulness of time-use studies in measuring work patterns. In deference to the bulk of existing time-use data, it focuses primarily on daily working patterns drawing on five existing time-use studies. Issues related to the definition and measurement of working patterns are raised, illustrative data is introduced and preliminary recommendations regarding the collection and application of time-use data for studying working hours are presented.

Data

The data are drawn from four countries: Canada (1992), Sweden (1991), the Netherlands (1990, 1995), and Norway (1980, 1990). The data for Canada is drawn from a single-day diary per respondent and results presented here draw on a weekly average of that data. The Swedish data is drawn from two diary days per respondent: one weekday and one weekend day. For Sweden, the results presented here are based on the weekday diaries. The Dutch study collected seven-day diaries from each respondent. The analysis of Dutch data below is based on 1995 Wednesday data and the seven-day data for both years. The Norwegian data are drawn from two-day diaries with the respondents completing the diaries for two consecutive days. Work patterns for the Norwegians are calculated across the two consecutive days. Cross-temporal patterns are explored with the Norwegian and Dutch data. These data provide an ideal opportunity to examine cross-temporal change since data are available for comparable cross-sectional studies carried out in both 1980 and 1990 for Norway and 1990 and 1995 for the Netherlands. Appendix A presents further information on the selected data sets.

Measurement problems

In theory, time-use studies are a simple tool for exploring time allocation and the temporal distribution of activity cross-temporally and cross-nationally. In practice, exploration of these issues is highly complex, due to the myriad ways in which the time-use data are collected and stored. Differences exist in the days for which diaries are collected (all days of the week, selected days like workdays or weekend days or a Friday and a Saturday); time period covered by diaries (part of a day, a full day, multiple days); the time scale used to record activities (from 5 minutes to open interval); and the starting time of the daily diary (midnight, 2:00 a.m., 4:00 a.m.). Together, these and other choices made in collecting, recording and storing data, generate a broad range of issues that must be dealt with at the analysis level.

² A. Mata-Greenwood: *An integrated framework for the measurement of working time*, Working Paper No. 92-2 (Geneva, ILO, 1992).

Below we observe that the study of working hours ideally calls for diaries covering a week or longer. Currently, such diaries exist for the Netherlands and the United Kingdom. However, for most countries, the data cover only one of a few weekdays. And, true to the plethora of options available, some of which are identified above, the data immediately available for this study vary considerably in their treatment of the options available.

In presenting results in this preliminary study, little attempt has been made to bring maximum comparability across studies with a view to comparing patterns across countries. In contrast, decisions have generally been made on a country-by-country basis to test the potential for using such data to explore working hours of various sub-populations. Specifically, working hours are explored below in terms of sex, age, marital status and age of youngest child. Beyond this, the various studies provide variables that make it possible to explore the effects of various job characteristics on work arrangements. A number of these are examined below.

Work and core working hours

For this study, work was defined as all paid work performed by employees and self-employed workers, encompassing regular paid work, overtime work and work at a second job. Work episodes were defined as single occurrences of paid work activity separated by 60 or more minutes from any other paid work episodes. If two occurrences were interrupted by breaks of less than 60 minutes, they were considered to be the same episode, which continued until terminated by a non-paid activity lasting 60 or more minutes.

In all countries, one can identify a period when the major portion of the country's employed workers are "at work". However, activities during this period may or may not be productive. Scheduled and unscheduled breaks typically intrude on the paid work period. Understanding the nature and scheduling of paid work requires understanding the stretch of time (including direct work and non-work activities) in a day allocated to paid work. While individual patterns may differ, the aggregated patterns of individuals, marking starting and ending times, facilitate the definition of the social work time, that is, the proportion of workers in a society performing paid activity at any given point in the day and the distribution of this proportion over the hours of the day.

Core working times, defined in terms of start and end times of work episodes defined earlier in the paper, vary across countries, as shown in Figures 1 and 2. Based upon these observations, initial definitions of core hours for each country were established. Following the Canadian and Swedish approach to data capture, pre-core hours start at 4:00 a.m. when an individual makes the first entry in the diary. Post core hours end at midnight. The time from midnight until 4:00 a.m. was designated as "night". In our samples, very few activities were found to be taking place during night. To simplify the analysis, given varying diary starting times, night activities are not reported here. Table 1 summarizes definitions of pre-core, core and post-core work times for each country. While we now deem our initial definition of core too narrow, it was framed as the time between the peak onset of starting work and the peak onset of ending work. As revealed in Figures 1 and 2, this yields differing core periods across countries, which are further clarified in Table 1.

Figure 1. Work episode start times

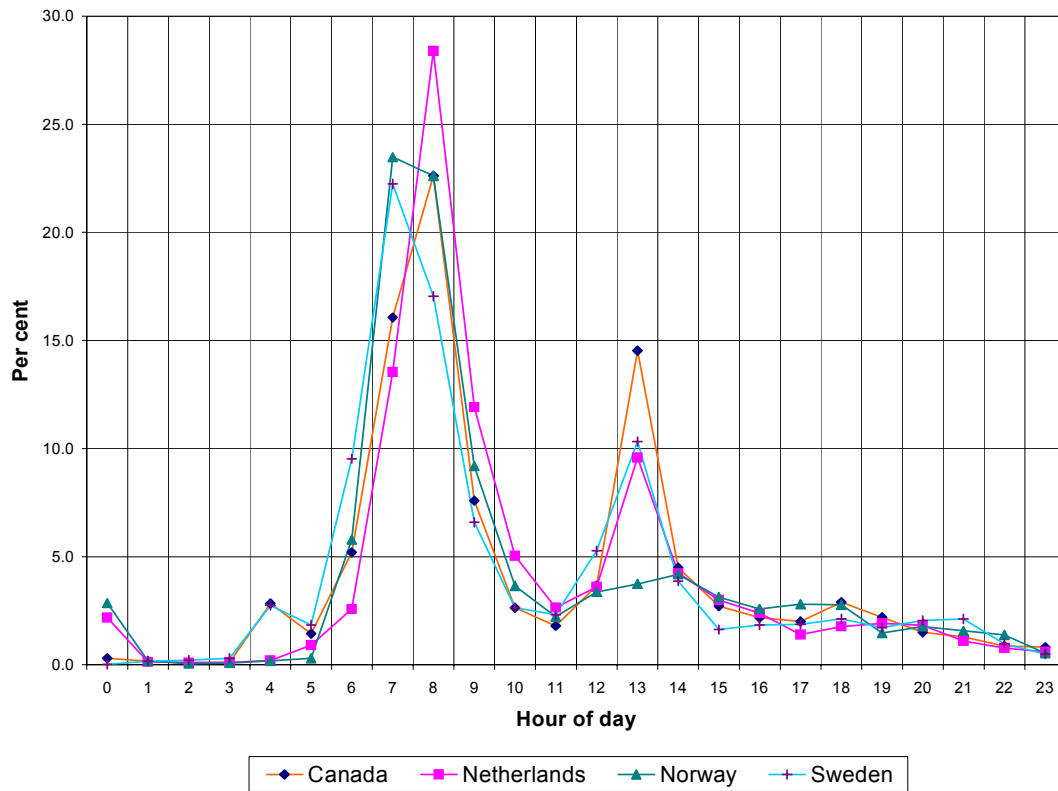


Figure 2. End-hour of work activities

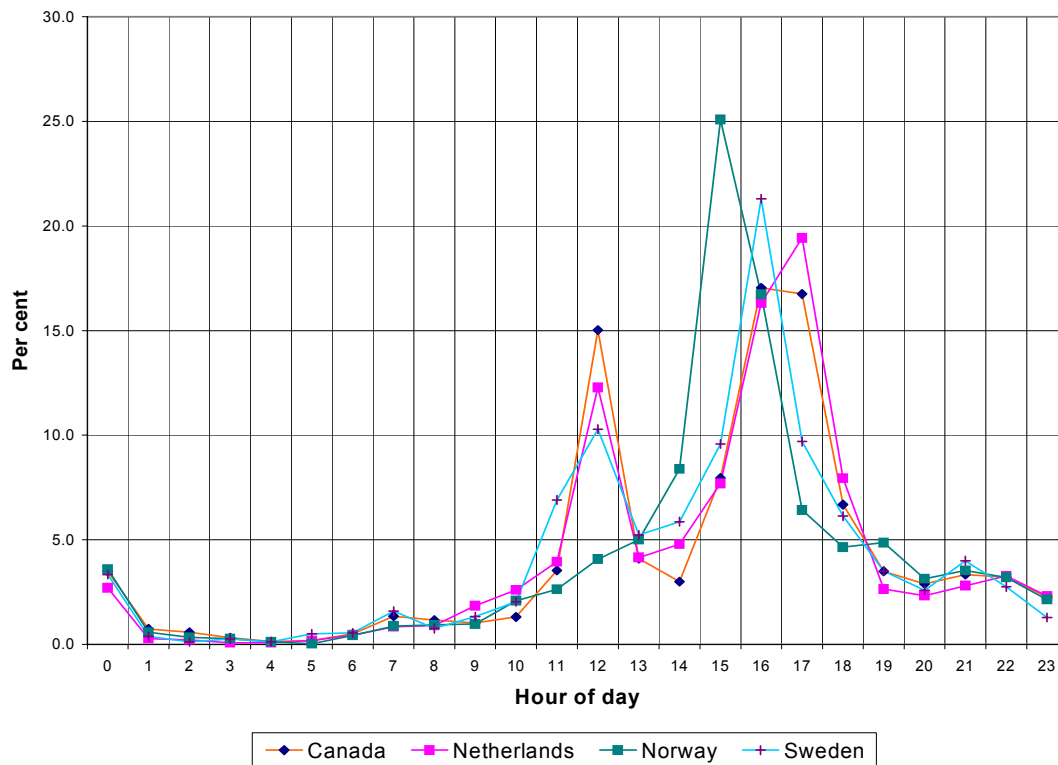


Table 1. Core, pre-core and post-core work hours by site

Site	Pre-core	Core	Post-core	Night
Canada 1992	04:00-08:00	08:00-18:00	18:00-midnight	midnight-04:00
Netherlands 1995-Wed.	04:00-08:00	08:00-18:00	18:00-midnight	midnight-04:00
Norway 1980	04:00-07:00	07:00-16:00	16:00-midnight	midnight-04:00
Norway 1990	04:00-07:00	07:00-16:00	16:00-midnight	midnight-04:00
Sweden 1991	04:00-07:00	07:00-16:00	16:00-midnight	midnight-04:00

For purposes of this initial analysis, the following typology of work episodes during a 24-hour period was defined:

1. Pre-core only (preonly)
2. Pre-core ending in core (preendco)
3. Core only (coreonly)
4. Post-core only (postonly)
5. Core start ending in post-core (corepost)
6. Pre-core start ending post-core (prepost)
7. Starting and ending at night (night)

The typology of work episodes translates into the following patterns:

- all work episodes are totally before core hours (pre core only);
- all work episodes are totally within core hours (core only);
- all work episodes are totally after core hours (post-core only);
- at least one work episode is totally before core hours and the rest are within core hours (pre-core and core);
- at least one work episode is partly before core hours and the rest are within core hours (pre-end core and core);
- at least one work episode is totally after core hours and the rest are within core hours (post-core and core);
- at least one work episode is partly after core hours and the rest are within core hours (core-post and core);
- at least one work episode is partly or wholly before core hours and at least one work episode is partly or wholly after core hours (pre-core, pre-end core and post-core).

Having defined the various work episode settings above, the combinations of settings reflected in the work pattern of individual respondents was determined by creating a hypercode reflecting all the realized possibilities. Counts of each type of episode were converted to a binary number: 1 if the respondent had an episode of the indicated type, and 0 if they did not.

$$\text{coretype} = \text{preonly} * 10000 + \text{coreonly} * 1000 + \text{postonly} * 100 + \text{preendco} * 10 + \text{corepost}$$

Table 2. Empirical work time patterns

	Start of episode	End of episode	Value	Hypercode
Preonly	Before core	Before core	1	10000
Coreonly	Core	Core	1	1000
Postonly	After core	After core	1	100
Preendco	Before core	Core	1	10
Corepost	Core	After core	1	1
All present				11111

Theoretically the values of corehype could run from 0000, where an individual engaged in no work episodes of the types identified, to 11111, if, in the course of the day, the individual engaged in at least one episode of each type. Frequency distributions of corehype, accounting for the ten collapsed categories of corehype for all the studied countries (Table 3) and for all combinations in Canada 1992 (Table 4) show, as one would expect, that some combinations are common while others are non-existent. In all sites, the value “core only” (01000) was the dominant work arrangement. In Sweden and Norway, “core post” (00001) was the next dominant work arrangement. The second most dominant arrangement in the Netherlands was “pre-end core” (00010), and in Canada, “pre-end core” and “core only.” (00011) were common. Based on inspection of the Canadian distribution of corehype (Table 4), the individual work patterns shown in Table 2 were identified for analysis.

For purposes of exploring the weekday/weekend effects, the hyper-code was extended by the addition of a weekday (1) and weekend day (2) value as the first digit for Canada 1992. The effects are discussed below and presented in Table 12 (e.g. 101000 would be “coreonly” on a weekday and 201000 would be “coreonly” on a weekend day).

Table 3. Classification of workers' daily work arrangements

	Sweden 1991		Netherlands 1990		Netherlands 1995		Norway 1990		Norway 1980		Canada 1992	
	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %
Core only	764	31.4%	3365	51.7%	4297	55.1%	1110	50.4%	1361	50.8%	1515	42.5%
Core only and Pre-to-core	38	1.6%	399	6.1%	391	5.0%	12	0.5%	24	0.9%	697	19.6%
Pre-to-core	275	11.3%	994	15.3%	1142	14.6%	140	6.4%	204	7.6%	249	7.0%
Core and Core-to-post	367	15.1%	236	3.6%	286	3.7%	72	3.3%	122	4.6%	276	7.8%
Core-to-post	580	23.8%	588	9.0%	626	8.0%	462	21.0%	477	17.8%	217	6.1%
Post only and Core-to-post	88	3.6%	266	4.1%	298	3.8%	184	8.4%	173	6.5%	121	3.4%
Core only, Core-to-post, Post only	120	4.9%	301	4.6%	360	4.6%	151	6.9%	223	8.3%	110	3.1%
Pre-to-core and Core-to-post	25	1.0%	68	1.0%	79	1.0%	5	0.2%	8	0.3%	74	2.1%
Three or more other schedules	38	1.6%	87	1.3%	111	1.4%	29	1.3%	42	1.6%	100	2.8%
Less than three other periods	140	5.7%	208	3.2%	212	2.7%	37	1.7%	45	1.7%	202	5.7%

Table 4. Distribution of combination of episodes over the day: Canada (1992)

Episode type	Coretype	Frequency	Per cent	Cumulative per cent
No work episodes of types A – E.	0.00	60	1.7	1.7
(A) Episode starts in core hours, ends after core hours	1.00	230	6.5	8.1
(B) Episode starts before core hours, ends in core hours	10.00	296	8.3	16.5
Episodes of types A + B	11.00	80	2.2	18.7
(C) Episodes after core hours only	100.00	0	0.0	18.7
Episodes of types A + C	101.00	167	4.7	23.4
Episodes of types A + B + C	111.00	37	1.0	24.4
(D) Episodes in core hours only	1000.00	1483	41.6	66.1
Episodes of types A + D	1001.00	246	6.9	73.0
Episodes of types B + D	1010.00	636	17.9	90.8
Episodes of types A + B + D	1011.00	31	0.9	91.7
Episodes of types C + D	1100.00	0	0.0	96.2
Episodes of types A + C + D	1101.00	158	4.4	96.2
Episodes of types B + C + D	1110.00	0	0.0	96.2
Episodes of types A + B + C + D	1111.00	30	0.8	97.0
(E) Episodes before core hours only	10000.00	25	0.7	97.7
Episodes of types A + E	10001.00	6	0.2	97.9
Episodes of types B + E	10010.00	9	0.3	98.1
Episodes of types A + B + E	10011.00	0	0.0	98.1
Episodes of types C + E	10100.00	0	0.0	98.1
Episodes of types A + C + E	10101.00	31	0.9	99.0
Episodes of types B + C + E	10110.00	0	0.0	99.0
Episodes of types A + B + C + E	10111.00	0	0.0	99.0
Episodes of types D + E	11000.00	14	0.4	99.4
Episodes of types A + D + E	11001.00	8	0.2	99.6
Episodes of types B + D + E	11010.00	7	0.2	99.8
Episodes of types A + B + D + E	11011.00	0	0.0	99.8
Episodes of types C + D + E	11100.00	0	0.0	99.8
Episodes of types A + C + D + E	11101.00	4	0.1	99.9
Episodes of types B + C + D + E	11110.00	0	0.0	99.9
All episode types (A + B + C + D + E)	11111.00	3	0.1	100.0
Total		3561	100.0	

Measurement issues

Definition of pre-core, post-core. These classifications, as considered here, run into each other and are only arbitrarily distinguished by setting a time which marks the end of the post-core period and the start of the pre-core. Choice of the dividing line needs to consider both policy relevance and data structure. The starting time of diaries has implications for interpretation of work in the post- and pre-core periods. In some countries, the designers of time diary studies have assumed that most people would be asleep at 04:00, and started the collection of information at 04:00 in the hopes of minimizing the potential for left censoring, and consequently a dividing line between post-core and pre-core has been drawn at 04:00 in this report. Nevertheless, future work should consider whether there are grounds for shifting this dividing line to another time, such as midnight. Cultural variation between countries may result in a need for different dividing lines for each country, particularly as it became clear that the definition of core hours has a significant impact on the pre/core/core-post core transitions.

Greater attention needs to be paid to the definition of core and, potentially, some criteria need to be set for defining it cross-nationally. The general rule adopted here was to set the start time as the hour registering the highest number of work starts and the end time at the point where the number of work episodes ending peaked. Alternatively, it might be best to use a distribution of the percentage of people at work by hour of the day and establish the core as a period during which an agreed percentage of the workforce were at work.

Definition of standard categories of work time arrangements. The analysis here has established empirically identified clusters. These, and possibly other, classifications need to be reviewed in terms of their ability to capture existing and evolving arrangements and their policy relevance.

Definition of measurement base. The analysis here is focused on daily patterns. Attention also needs to be given to more extended periods of multiple days, a week or longer. This is discussed more fully below under future directions.

Identified work patterns

Based on the classifications developed above, preliminary analyses of work time patterns were carried out for single years for Canada (1992) and Sweden (1991), and for two years for the Netherlands (1990 and 1995), for Wednesdays in the Netherlands 1995 data, and for Norway (1980 and 1990). We would have preferred to analyse data on all countries for more than a year to assess whether our results are sensitive to the chosen year. However, this was possible only with the data from the Netherlands and Norway. Identified patterns were examined in terms of sex, age group, marital status and age of youngest child. Additionally, arrangements are explored in terms of various job characteristics.

We have organized data for work time arrangements for employed individuals in the following manner. First, in Table 5A, we present a distribution of population according to work time arrangements in each country for males and females. The sex composition of each work time arrangement is presented in Table 5B. These two tables provide an overview of our overall results. Also, for each country we have included three sets of Tables in Appendix B, providing information on work time arrangements according to a more detailed demographic information of workers, age, marital status and age of youngest child all by sex.

Finally, it should be noted that while data on all countries are averages for the week, we also initially picked up one particular day, Wednesday in the case of the Netherlands, to assess any difference from the average weekdays. However, due to smaller number of observations for Wednesday, we decided to also analyse data from the Netherlands for the whole week.

It is observed in Tables 5A and 5B that there are vast differences in work time arrangements across countries. These differences exist even if we consider countries like Canada and the Netherlands, who have the same definitions of different work times according to hours of the day. However, it is clear that, except for women in the Netherlands, close to half of employed men and women in each country have multiple work time arrangements. Both men and women in Sweden exhibit the highest incidence of multiple work time arrangements based on the assumptions used here.

In Canada, only 35.9 per cent of males worked core-only hours, while another 22.6 per cent worked core only and pre-core to core (Table 5A). The latter group would have had a pattern of work consisting of a work episode starting before 8:00 a.m. and continuing after 8:00 a.m. and another episode separated from the first by at least 60 minutes which started and ended between 8:00 a.m. and 6:00 p.m. compared with 50.7 per cent of females (Table 5A). Canadian females had 50.7 per cent of their work episodes in the core and another 15.8 in the core only and pre-to-core periods, about two-thirds in all. In the Netherlands, two-thirds of female work episodes were concentrated in the core only (Table 5A). In Norway and Sweden, women's episodes are concentrated in the core and core-to-post periods. The earlier starting and ending times for the core in these sites may have had some influence on these patterns in Norway and Sweden.

Females tend to dominate core only (53.4 versus 46.6 per cent) and core-to-post arrangements (54.4 versus 45.6), while Canadian men dominate the remaining arrangements (Table 5B). In particular, the pattern pre-to-core and core-to-post appears to be avoided by women whose greatest share in the arrangement was only 25 per cent in Norway in 1980. In general, women seem to be over-represented in core only, core-to-post, and post only and core-to-post arrangements.

In European data, men dominate the core-only and pre-to-core pattern (77.5 to 91.3 per cent) relative to Canada (63.7 per cent, Table 5B). This suggests a tendency of Canadian women to arrive earlier at work (36.3 per cent), relative to men, than their Dutch (8.7 per cent) or Swedish (21.05 per cent) counterparts. In all four countries, women are less likely to have odd schedules such as those incorporated in the two "other" categories.

Men in the Netherlands and Norway are more evenly distributed over the work time arrangements than those in Canada and Sweden (Tables 5A and 5B). Distribution of women tends to be more skewed towards earlier hours of the day in all countries.

Work patterns in Canada and the Netherlands tend to be more oriented toward the morning pre-core and core hours relative to Sweden with a post-core orientation. However, it appears that some of this is due to the shorter core initially defined for Sweden.

A more detailed breakdown of the above results is presented in three sets of tables for each country provided in Appendix B. The first set of tables (Tables 6A-6E) presents data on work time activity in each country by gender and age distribution. Across countries, there appears to be a pattern of multiple work time activity increasing for persons in the 25-44 age group. Elderly men and women (those over the age of 65 years) have fewer multiple patterns.

Table 5A. Overview of work time arrangements

<i>Work time arrangements</i>	Panel A: Male Group totals											
	Canada		Netherlands		Netherlands		Sweden		Norway (1990)		Norway (1980)	
	1995 Wed.	Per cent of males	1990 week	Per cent of males	1995 week	Per cent of males	1990 week	Per cent of males	1995 week	Per cent of males	1990 week	Per cent of males
Core only	35.9	46.70	42.7	46.9	27.80	47.5	49.04					
Core only and Pre-to-core	22.6	5.04	8.9	6.7	1.75	0.8	1.3					
Pre-to-core	8.0	21.49	20.5	19.1	12.50	6.9	9.2					
Core and Core-to-post	8.0	2.40	4.2	4.0	12.91	4.2	5.2					
Core-to-post	5.0	7.56	7.8	8.2	21.32	19.9	15.6					
Post only and Core-to-post	3.4	2.76	3.8	3.6	5.84	9.3	6.3					
Core only, Core-to-post, Post only	3.3	7.08	4.9	4.8	5.84	7.6	9.2					
Pre-to-core and Core-to-post	3.1	0.96	1.4	1.4	1.40	0.4	0.4					
Three or more other schedules	3.6	2.88	1.7	1.7	1.87	1.3	1.2					
Less than three other schedules	7.0	3.12	3.9	3.6	8.76	2.1	2.6					
Total	100.0	100.00	100.0	100.0	100.00	100.00	100.0					

<i>Work time arrangements</i>	Panel B: Females Group totals											
	Canada		Netherlands		Netherlands		Sweden		Norway (1990)		Norway (1980)	
	1995 Wed.	Per cent of females	1990 week	Per cent of females	1995 week	Per cent of females	1990 week	Per cent of females	1995 week	Per cent of females	1990 week	Per cent of females
Core only	50.7	70.37	63.26	66.5	35.02	52.2	53.3					
Core only and Pre-to-core	15.8	0.67	2.54	2.7	0.60	0.3	0.4					
Pre-to-core	5.7	9.43	8.49	8.4	9.43	4.7	5.4					
Core and Core-to-post	7.4	1.52	2.85	3.1	13.96	3.2	3.6					
Core-to-post	7.4	6.06	10.60	7.8	25.13	24.4	20.9					
Post only and Core-to-post	3.4	3.54	4.44	4.1	5.51	7.7	6.7					
Core only, Core-to-post, Post only	2.9	6.23	4.23	4.3	5.43	5.3	7.1					
Pre-to-core and Core-to-post	0.9	0.34	0.56	0.5	0.53	-	0.2					
Three or more other schedules	1.8	1.18	0.81	1.0	0.98	1.1	2.1					
Less than three other schedules	4.0	0.67	2.22	1.5	3.40	1.1	0.4					
Total	100.0	100.00	100.00	100.0	100.00	100.00	100.0					

Table 5B. Overview of work time arrangements: Gender split

Work time arrangements	Panel A: Male													
	Canada		Netherlands 1995		Netherlands 1990		Netherlands 1995		Sweden		Norway (1990)		Norway (1980)	
	Per cent in work arrangement	Wednesday	Per cent in work arrangement	Week	Per cent in work arrangement	Week	Per cent in work arrangement	Week	Per cent in work arrangement	Week	Per cent in work arrangement	Week	Per cent in work arrangement	Week
Core only	46.6	48.20	46.63	49.73	50.64	56.5	56.5	50.64	52.5	52.5	56.5	56.5	56.5	
Core only and Pre-to-core	63.7	91.30	81.95	77.49	78.95	83.3	83.3	78.95	78.6	78.6	83.3	83.3	83.3	
Pre-to-core	63.5	76.17	75.75	76.09	63.13	70.6	70.6	63.13	64.1	64.1	70.6	70.6	70.6	
Core and Core-to-post	57.2	68.97	65.68	64.34	54.43	67.2	67.2	54.43	61.9	61.9	67.2	67.2	67.2	
Core-to-post	45.6	63.64	48.81	59.58	52.29	51.4	51.4	52.29	49.7	49.7	51.4	51.4	51.4	
Post only and Core-to-post	54.5	52.27	52.63	55.03	57.80	56.6	56.6	57.80	59.5	59.5	56.6	56.6	56.6	
Core only, Core-to-post, Post only	58.2	61.46	60.13	60.83	58.14	64.6	64.6	58.14	63.5	63.5	64.6	64.6	64.6	
Pre-to-core and Core-to-post	81.1	80.00	76.47	79.75	77.42	75.0	75.0	77.42	100.0	100.0	75.0	75.0	75.0	
Three or more other schedules	71.0	77.42	73.56	71.17	71.11	45.2	45.2	71.11	58.1	58.1	45.2	45.2	45.2	
Less than three other schedules	68.3	86.67	69.71	77.36	76.92	91.1	91.1	76.92	69.8	69.8	91.1	91.1	91.1	
Total	55.2	58.37	56.40	58.38	56.37	58.5	58.5	56.37	54.8	54.8	58.5	58.5	58.5	

Work time arrangements	Panel B: Female													
	Canada		Netherlands 1995		Netherlands 1990		Netherlands 1995		Sweden		Norway (1990)		Norway (1980)	
	Per cent in work arrangement	Wednesday	Per cent in work arrangement	Week	Per cent in work arrangement	Week	Per cent in work arrangement	Week	Per cent in work arrangement	Week	Per cent in work arrangement	Week	Per cent in work arrangement	Week
Core only	53.4	51.80	53.37	50.27	49.36	43.5	43.5	49.36	47.5	47.5	43.5	43.5	43.5	
Core only and Pre-to-core	36.3	8.70	18.05	22.51	21.05	16.7	16.7	21.05	21.4	21.4	16.7	16.7	16.7	
Pre-to-core	36.5	23.83	24.25	23.91	36.87	29.4	29.4	36.87	35.9	35.9	29.4	29.4	29.4	
Core and Core-to-post	42.8	31.03	34.32	35.66	45.57	32.8	32.8	45.57	38.1	38.1	32.8	32.8	32.8	
Core-to-post	54.4	36.36	51.19	40.42	47.71	48.6	48.6	47.71	50.3	50.3	48.6	48.6	48.6	
Post only and Core-to-post	45.5	47.73	47.37	44.97	42.20	43.3	43.3	42.20	40.5	40.5	43.3	43.3	43.3	
Core only, Core-to-post, Post only	41.8	38.54	39.87	39.17	41.86	35.4	35.4	41.86	36.5	36.5	35.4	35.4	35.4	
Pre-to-core and Core-to-post	18.9	20.00	23.53	20.25	22.58	25.0	25.0	22.58	-	-	25.0	25.0	25.0	
Three or more other schedules	29.0	22.58	26.44	28.83	28.89	54.8	54.8	28.89	41.9	41.9	54.8	54.8	54.8	
Less than three other schedules	31.7	13.33	30.29	22.64	23.08	8.9	8.9	23.08	30.2	30.2	8.9	8.9	8.9	
Total	44.8	41.63	43.60	41.62	43.63	41.5	41.5	43.63	45.2	45.2	41.5	41.5	41.5	

The second set of tables (Tables 7A-7G) presents work time arrangements by gender and marital status. Initial inspection of the data suggests that marital status, in and of itself, has relatively little effect on work patterns. Married Swedish men and women stand out in exhibiting multiple work time activity. More than 70 per cent of men and more than 60 per cent of women in Sweden are involved in multiple work time activity.

The last set of tables (Tables 8A-8F) presents data on work time activity in each country by the age of youngest child. Vast differences are observed across countries. In Canada, women were much less likely to work no core hours if they had any children.

Analyses of work arrangements by time and selected labour market characteristics

The above data have been analysed for one year only. One may expect changes in work patterns over time as the economic and social environments change. Our available data permit this breakdown of analysis for Norway for the years 1980 and 1990; and the Netherlands for the years 1990 and 1995. Furthermore, one may also expect variations in the above results according to industries, occupations and job tenure of individuals. We are able to conduct this breakdown of our analysis using 1980 data for Norway, 1991 data for Sweden, and 1992 data for Canada.

Figures 3 and 4 provide an overview for both sexes in Norway and the Netherlands for the available years. The Norwegian data suggest that there was a tendency in the 1980s for the work pattern to shift in that country from core and pre-core hours towards post-core hours. In other words, the work schedules of individuals shifted from an earlier time of the day towards a later time of the day during the 1980s. One possible reason for this shift was the introduction of extended shopping hours in Norway in the mid-1980s. The work pattern changed slightly in the opposite direction in the Netherlands over the early 1990s where the preference for work during core hours increased³. Apart from different conditions in the two countries, one could also generalize these results as reflections of different economic times that prevailed over the 15-year period (1980-1995) in both countries. The severe recessions of the 1980s may have caused individuals to extend their working hours beyond core hours by limiting their choice of work time, while relatively better economic conditions of the 1990s may have removed such limitation and resulted in choice of earlier daytime work. Core time was the dominant work arrangement over the entire 15-year period.

³ The introduction in the 1990s of extended shopping hours is not reflected in the data from the Netherlands, which are for 1995.

Figure 3. Work time arrangements in Norway: Both sexes (1980 and 1990)

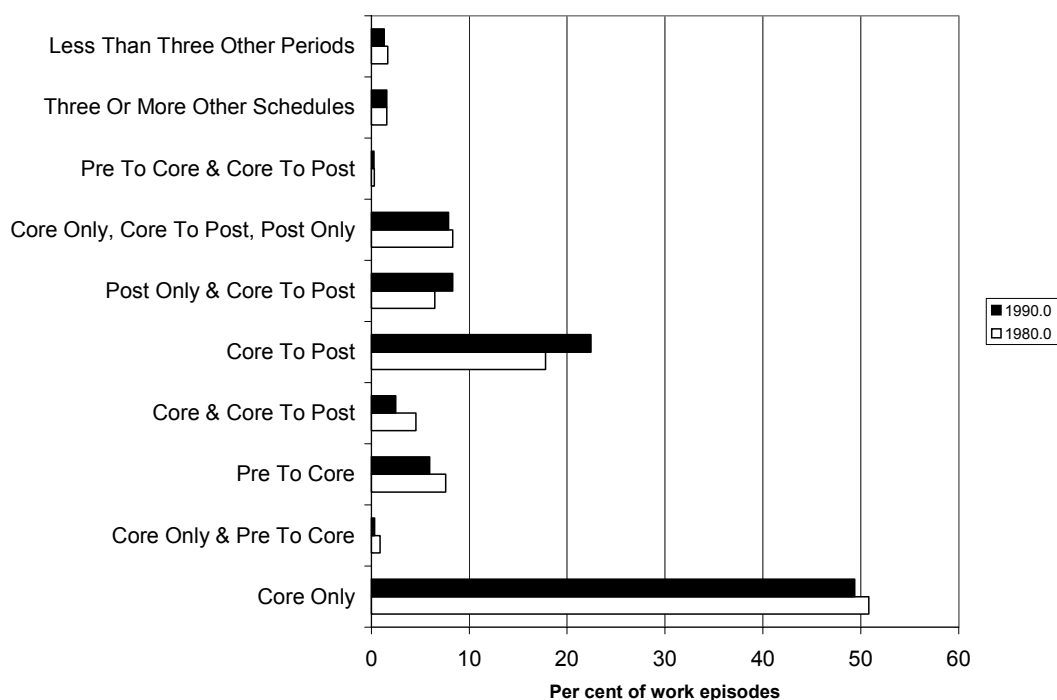
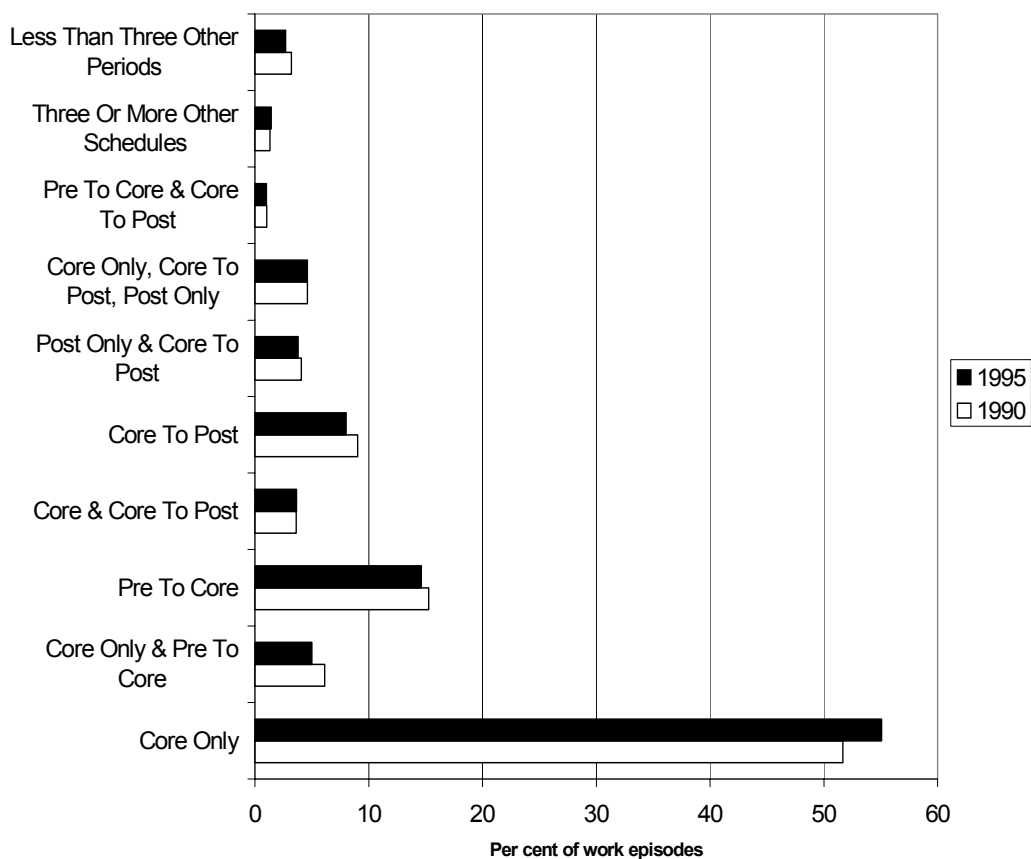


Figure 4. Work time arrangements in the Netherlands: Both sexes (1990 and 1995)



The Netherlands data also permit an analysis of work time arrangements by days of the week. These data are available separately for males and females for the years 1990 and 1995 and have been presented in Figures 5-8. Core-time work is the most frequent arrangement among men and women on all days of the week. Among both men and women, multiple work arrangements are less popular on Fridays than any other day of the week. This is evidenced by the fact that Friday shows the greatest share of core-only episodes (Figures 6-8). Among women, however, the multiple work arrangements appear to be relatively more evenly distributed over the week. This result could be partly explained by the additional home care responsibility of women, which requires them to have more flexible hours. Between 1990 and 1995, women's episodes appear to have moved somewhat toward core hours only.

For women, the proportion of work episodes in time slots other than core only differed very little day-to-day in 1990 except for Sunday, where less than 30 per cent was in the core only (Figure 6). Core only plays a minor role on Sundays. Typically, Sunday work occurs later in the day as can be noted in the various post-core arrangements (Figures 6-8).

Figure 5. Work time arrangements during the days of the week: Netherlands (Males, 1990)

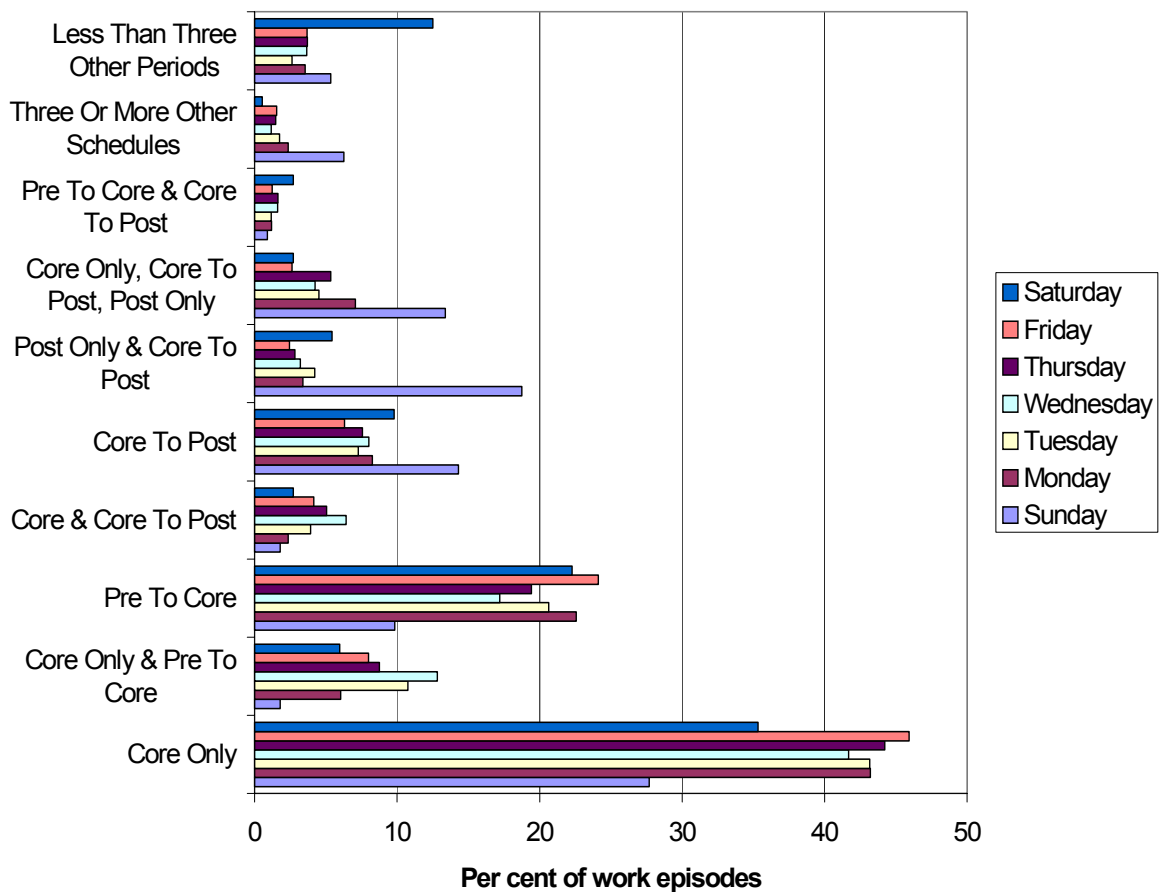


Figure 6. Work time arrangements during the days of the week: Netherlands (Females, 1990)

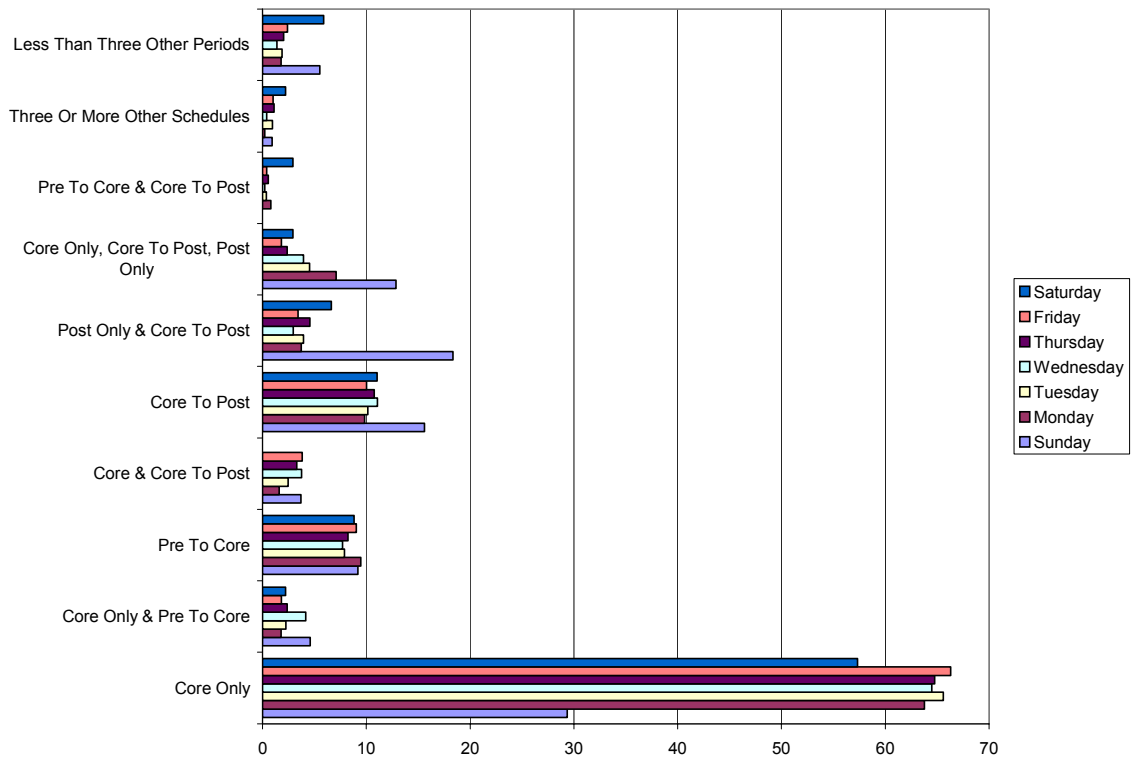


Figure 7. Work time arrangements during the days of the week: Netherlands (Males, 1995)

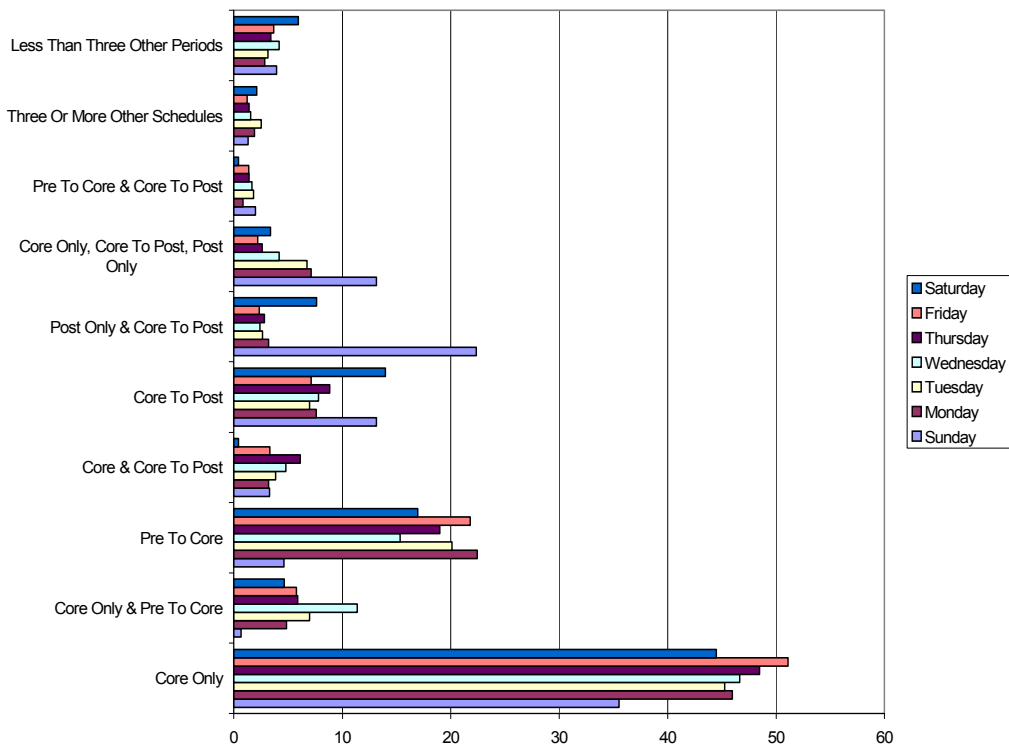
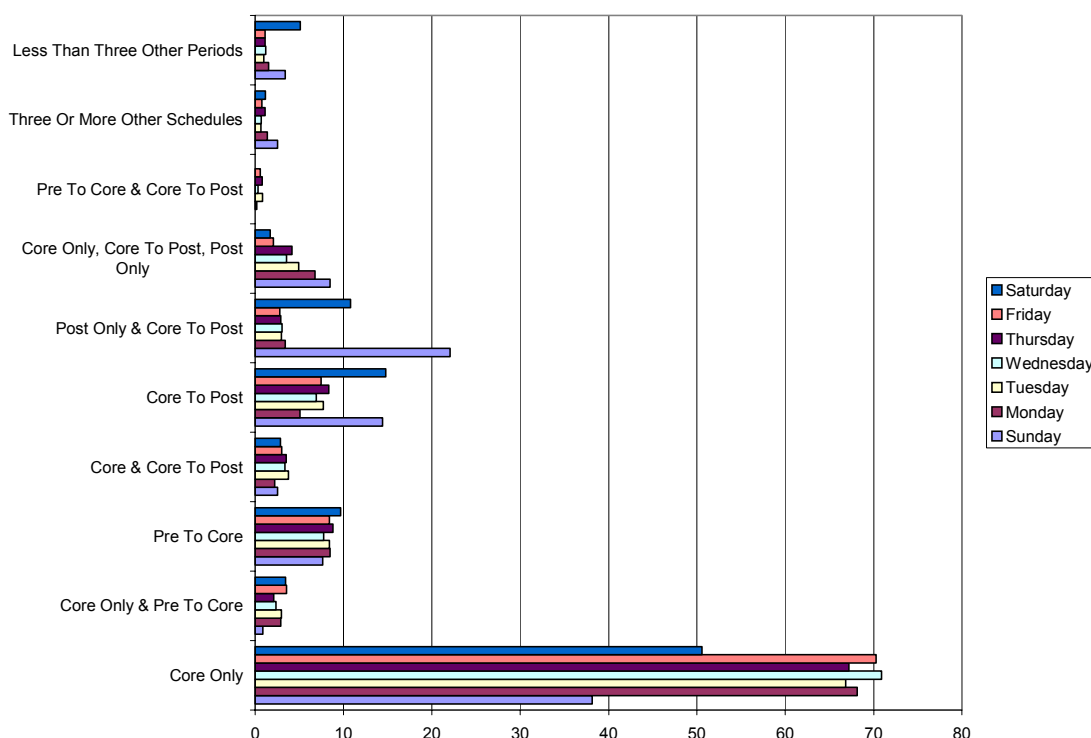
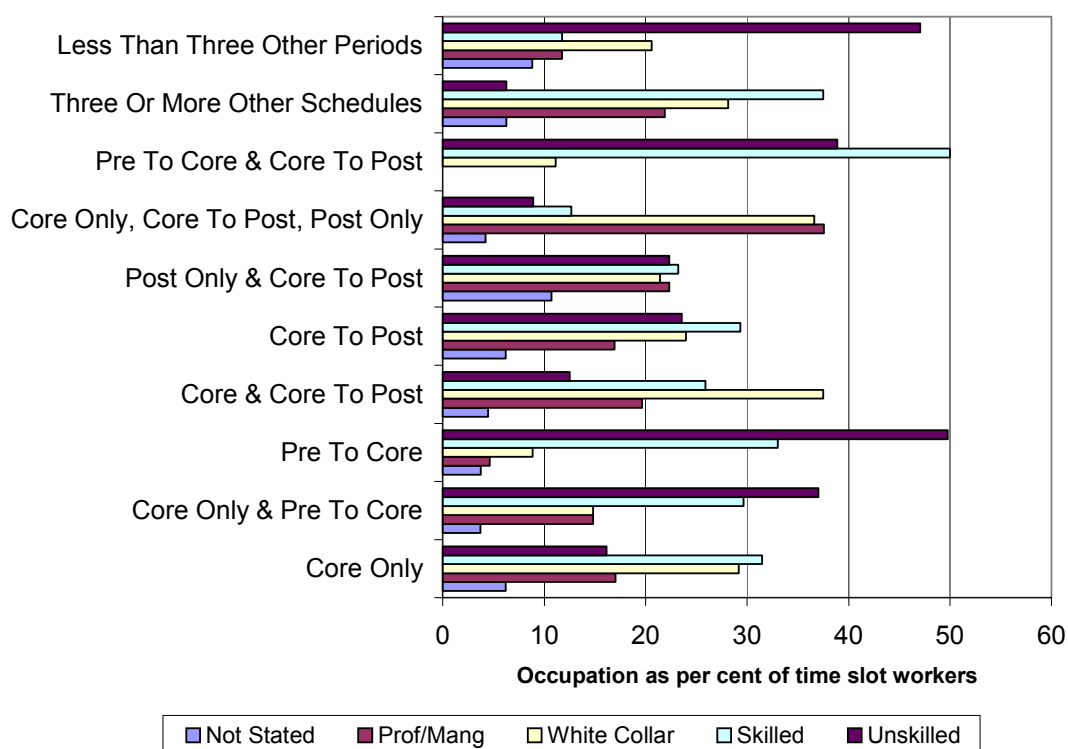


Figure 8. Work time arrangements during the days of the week: Netherlands (Females, 1995)



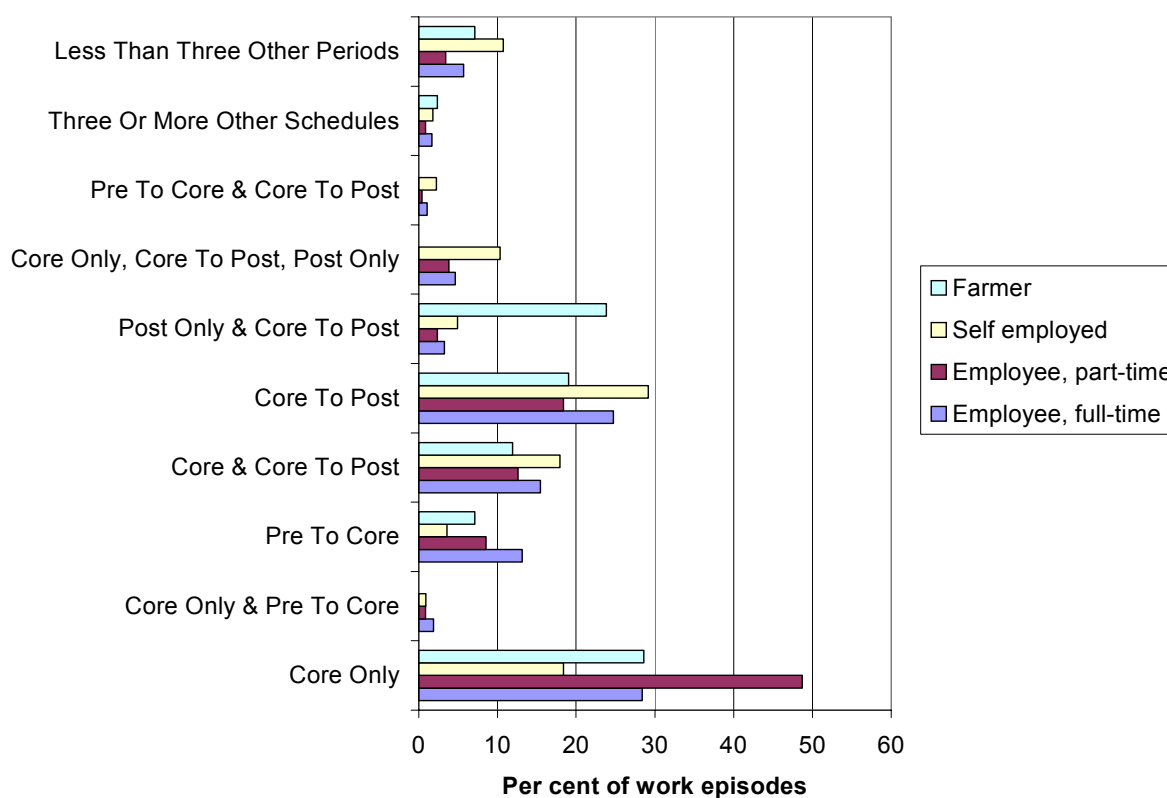
The 1980 data for Norway also permit an analysis of work time arrangements for the following occupational categories: skilled, unskilled, white collar, professional and managerial, not stated. These breakdowns are presented in Figure 9. It appears that unskilled and skilled workers are early starters during the day, i.e. are somewhat more concentrated in pre-to-core and post-core hours; while professionals, managers and white-collar workers tend to be late starters, i.e. are somewhat more concentrated in core to post-core hours. Concentration of skilled workers in pre-to-core and core-to-post periods may reflect longer hours for skilled workers. Overall however, no definite patterns are observed as the occupational distribution is well represented in all work time arrangement categories.

Figure 9. Work patterns by occupation: Norway (1980)



Distributions of work time arrangements by job tenure are available for the year 1991 for Sweden and for the year 1992 for Canada, although for different categories of workers. Swedish data are presented in Figure 10 for the following categories: full-time employee, part-time employee, self-employed and farmer. All categories of Swedish workers tend to start late and finish late during the day as their representation in core only and core only and core-to-post shows. Part-time employees are heavily concentrated in core-only type of work arrangements. This observation could reflect the effect of recession in the early 1990s, which may have resulted in job openings that were mostly part time. Swedish full-time employees are more evenly distributed, are late starters and have a greater tendency to work beyond core hours. Self-employed individuals dominate core and post-core hours, possibly implying that they tend to work longer hours. A large proportion of Swedish workers work in core-only hours.

Figure 10. Work patterns by job tenure: Sweden (1991)



For comparability purposes, Swedish data are also reported in Table 9 along with the 1992 Canadian data, which are available only for employed, self-employed and other categories. As seen from Table 9, a large proportion of Canadian workers also tend to work during core hours only, as do their Swedish counterparts. However, Canadian workers tend to be start work later than Swedish workers but finish around the same time as Swedish workers. Self-employed Canadians are heavily concentrated in core-only hours but are more evenly distributed over the work time arrangement than Swedish workers.

Canadian data also provide labour market information on union membership status and type of worker; whether “on-call” or not. This information has been summarized in Table 10. Around 38.5 per cent of union members in Canada work during core hours only, and 25.3 per cent work during core and pre-to-core. For non-union members, these percentages are 44.5 and 17.3, respectively. Thus, union members start earlier during the day. More union members have multiple work time arrangements.

Table 10 also shows work time arrangements for “on-call” workers. As expected, these workers tend to be more evenly distributed over work time arrangements than those who are not on call. However, their concentration in core only hours is worth noting.

Table 9. Job tenure effects on work time arrangements: Canada (1992) and Sweden (1991)

Job tenure	Canada 1992			Sweden 1991			
	Employee	Self-employed	Other	Employee full time	Employee part time	Self-employed	Farmer
Core only	43.3	40.4	46.7	28.4	48.7	18.4	28.6
Core only and Pre-to-core	21.8	11.2	13.3	1.9	0.9	0.9	
Pre-to-core	7	7.1	6.7	13.2	8.5	3.6	7.1
Core and Core-to-post	6.9	11.1	6.7	15.5	12.6	17.9	11.9
Core-to-post	6	5.8	20	24.7	18.4	29.1	19
Post only and Core-to-post	3.1	4.1		3.3	2.4	4.9	23.8
Core only, Core-to-post, Post only	2.4	5.3	6.7	4.6	3.8	10.3	
Pre-to-core and Core-to-post	1.6	4.3		1.1	0.4	2.2	
Three or more other schedules	2.6	4.1		1.7	0.9	1.8	2.4
Less than three other periods	5.4	6.5		5.7	3.4	10.8	7.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 10. Union membership and on-call work effects on work time arrangements: Canada (1992)

Work time arrangements	Union member		On-call worker		Total
	Yes	No	Yes	No	
Core only	38.5	44.5	36.0	45.0	42.5
Core only and Pre-to-core	25.3	17.3	16.9	20.7	19.6
Pre-to-core	7.2	7.0	8.8	6.4	7.0
Core and Core-to-post	6.4	8.2	10.5	6.8	7.8
Core-to-post	3.8	6.8	6.8	5.7	6.1
Post only and Core-to-post	3.8	3.1	4.5	2.9	3.4
Core only, Core-to-post, Post only	3.3	2.9	3.5	2.8	3.1
Pre-to-core and Core-to-post	1.2	2.5	2.7	1.9	2.1
Three or more other schedules	3.5	2.6	3.1	2.8	2.8
Less than three other periods	7.1	5.0	7.2	5.1	5.7
Total	100.0	100.0	100.0	100.0	100.0

Additional information on the distribution of Canadian workers by work time arrangements is provided in Table 11. These distributions are for workers with and without compressed weeks, types of work shifts (day, evening, night, split and rotating) and flexible schedules. Workers who work a compressed workweek are less likely to work core hours only than those who do not. However, in both categories (worked compressed week and not), there is greater concentration towards “core-only” hours.

More daytime Canadian workers are concentrated during “core only” and “core only and pre-to-core” hours. Obviously, the distributions of evening and night-time workers are more skewed towards later hours of the day. A large number of evening workers start their work during core time and finish after core. Workers with split and rotating shifts are more evenly distributed over work time arrangements, but are more concentrated during core-only hours. Finally, Canadians with flexible schedules do not show a significant difference in their distribution from those who do not work flexible schedules. Interestingly, however, they are less likely to work core-only and pre-to-core and more likely to work core and core-to-post (Table 11). Hence, it appears the flexibility is taken in later starting and ending times.

Examining the distributions over weekdays and weekend days for Canada 1992 provides another perspective on work arrangements. Approximately 12 per cent of both men’s and women’s work episodes occurred on the weekend, and the distribution across arrangements was amazingly similar between men and women (Table 12). The weekend appears to eliminate forces that appear to generate sex differences on weekdays.

Table 11. Work pattern effects on work time arrangements: Canada (1992)

	Compressed week		Work pattern						Flexible schedule	
			Regular shift			Split shift			Rotating shift	
	Yes	No	Day	Evening	Night	Day	Evening	Night	Yes	No
Core only	36.2	43.4	49.1	14.2	6.0	30.6			24.7	41.8
Core only and Pre-to-core	21.9	19.5	23.2	2.7	1.5	11.3			15.1	22.2
Pre-to-core	9.4	6.7	7.3	2.0	16.4	8.1			5.5	6.8
Core and Core-to-post	9.1	7.6	6.4	8.1	1.5	14.5			12.2	5.9
Core-to-post	5.8	6.0	3.2	39.9	7.5	14.5			9.6	6.0
Post only and Core-to-post	3.6	3.3	1.5	15.5	10.4	3.2			6.8	3.5
Core only, Core-to-post, Post only	2.4	3.0	2.3	7.4		1.6			4.9	2.8
Pre-to-core and Core-to-post	1.2	2.2	2.0			1.6			1.3	1.7
Three or more other schedules	3.0	2.8	2.6		1.5	6.5			4.2	2.7
Less than three other periods	7.3	5.4	2.5	10.1	55.2	8.1			15.8	6.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 12. Weekday and weekend work patterns: Canada (1992)

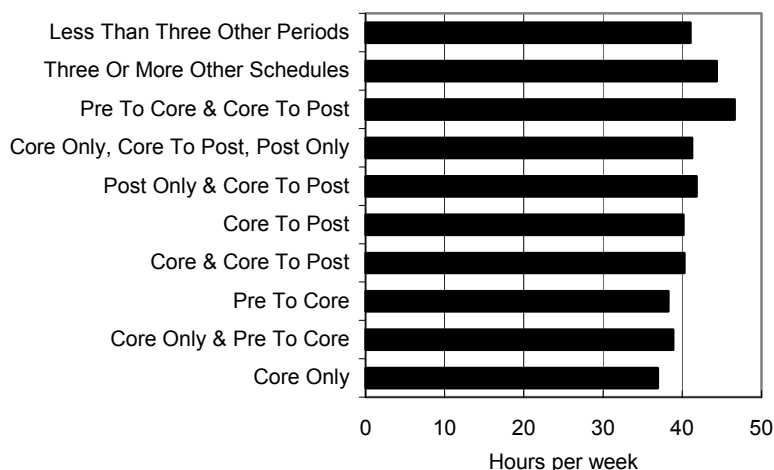
	Male		Female	
	Col %	Count	Col %	Count
Weekday core only	31.6	621	46.1	736
Weekday core only and pre-to-core	21.0	413	14.7	234
Weekday pre-to-core	7.0	138	4.9	79
Weekday core and core-to-post	6.9	136	6.4	103
Weekday core-to-post	4.0	79	6.1	98
Weekday post only and core-to-post	2.0	40	2.6	41
Weekday core only, core-to-post, post only	2.9	57	2.6	42
Weekday pre-to-core and core-to-post	2.8	55	0.7	11
Weekday three or more other schedules	3.4	66	1.6	25
Weekday less than three other periods	5.8	113	3.3	52
Weekend core only	4.3	85	4.6	73
Weekend core only and pre-to-core	1.6	31	1.2	19
Weekend pre-to-core	1.0	20	0.8	12
Weekend core and core-to-post	1.1	22	0.9	15
Weekend core-to-post	1.0	20	1.3	20
Weekend post only and core-to-post	1.3	26	0.9	14
Weekend core only, core-to-post, post only	0.4	7	0.3	4
Weekend pre-to-core and core-to-post	0.3	5	0.2	3
Weekend three or more other schedules	0.3	5	0.3	4
Weekend less than three other periods	1.3	25	0.8	12

Work arrangements and work hours

Work hours are not unrelated to work arrangements. When people work in a day will undoubtedly affect how long they can work in a day. Obviously, if one does not start work until 18:00, one cannot work more than six hours in that day. On the other hand, if one starts working before core hours, say at 7:00 a.m., one could potentially work 17 hours in that day. Below the empirical relationship between work arrangements and work hours is explored using data from Sweden and Canada. In all cases examined, workers exhibiting a pattern of “pre-to-core and core-to-post” recorded the longest work hours (Tables 9-12).

There are several approaches that can be taken to measuring work hours. One approach, typically adopted by standard labour force surveys, and typically questioned by time-use researchers, is to ask a respondent how long they worked last week. The question is also often included in time-diary surveys to provide a link to labour force surveys and as a basis for methodological examination. Swedish males working a core-only working arrangement registered the lowest stated weekly work hours, while working pre-to-core and core-to-post worked the longest hours (Figure 11).

Figure 11. Diary and stated hours by work arrangement: Sweden (Males, 1991)



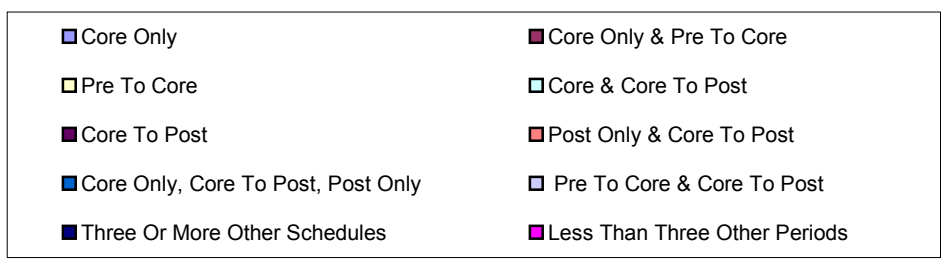
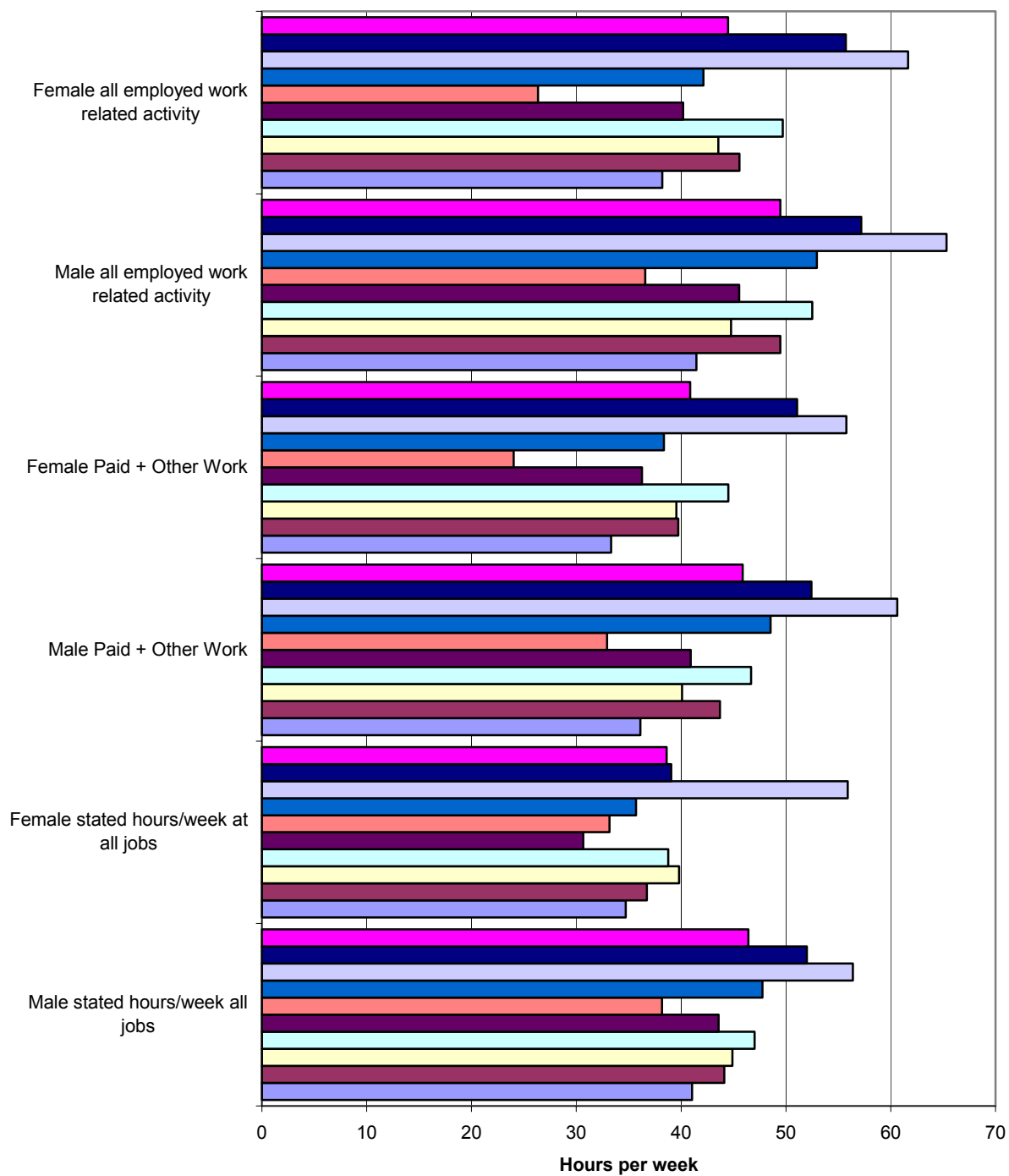
Work hours can also be calculated from reported diaries. If week-long diaries are used, the weekly hours can be directly summed. While seemingly straightforward, what time is considered to be work hours is not obvious. Time allocated to several work-related activities (i.e. breaks, waiting on the job, commuting, training time on the job) may, or may not, be included in either the respondents' estimates, or in the diary calculations. For purposes of examination, three estimates are used. First, respondent estimates, such as provided in Sweden, of total weekly hours allocated to main job and also to other paid jobs. Second, a comprehensive diary estimate incorporating all codes typically related to the major activity group "paid work". These include time on the job, breaks, travel to and from and on the job, job search, waiting, and also some other small categories. It will provide the largest estimate. Alternatively, work time can be considered to be only the time actually recorded as "paid work", either at the workplace, home or elsewhere, on all paid jobs. All three approaches are presented in Figure 12.

There is considerable variation in the average weekly hours attendant with the various work arrangements, regardless of the particular measure of work hours (Figure 12). Significance testing (see Figures 15 and 16) suggested that worker estimates of work hours (33 of 45 comparisons of work hours by arrangement) were much more affected by their work arrangement than was the case for hours derived from the diaries (15 of 45). This is not surprising given the subjective nature of duration.

In all cases examined, workers working pre-to-core and core-to-post registered the longest hours (Figure 12). Workers working post only and core-to-post registered the shortest working times for calculated hours measures and estimated hours by males. However, based on estimated hours by females, their shortest hours attended core only worker arrangement.

By all measures, workers working "pre-to-core and core-to-post" exhibited the longest daily work hours (Figure 12). This is not surprising. Workers starting work before the core and continuing beyond it could potentially, as indicated above, work 17 hours per day. Workers in this arrangement in Canada, using the broadest definition of work hours, averaged over 60 hours per week, assuming reported daily times and a five-day workweek. For women, the estimate was about 62 hours; for men, 65 hours. Also, the narrower diary estimates for time allocated directly on main and other jobs, exceeds 60 hours per week for males (Figure 11). For females, the corresponding time is 56 hours per week.

Figure 12. Stated and diary job hours by work arrangement and gender: Canada (1992)



Shortest weekly hours accompany working post only or core-to-post hours (Figure 12). Workers working only core hours work the next shortest hours. Beyond these observations, it is evident in Figure 12 that there is great variability in work hours in relation to work arrangements.

Figures 13 and 14 show, from a different perspective, some the results reported in Figure 12. They show respondent estimated weekly work time allocations to main job and other jobs. Firstly, as noted above, the longest hours are put in by workers working “pre-to-core and core-to-post” arrangements (Figures 13-14). For males, workers working “core only, core-to-post and post only” work episodes had the highest estimated other work time expenditure.

Figure 13. Stated main and other job hours by work arrangement: Canada (Males, 1992)

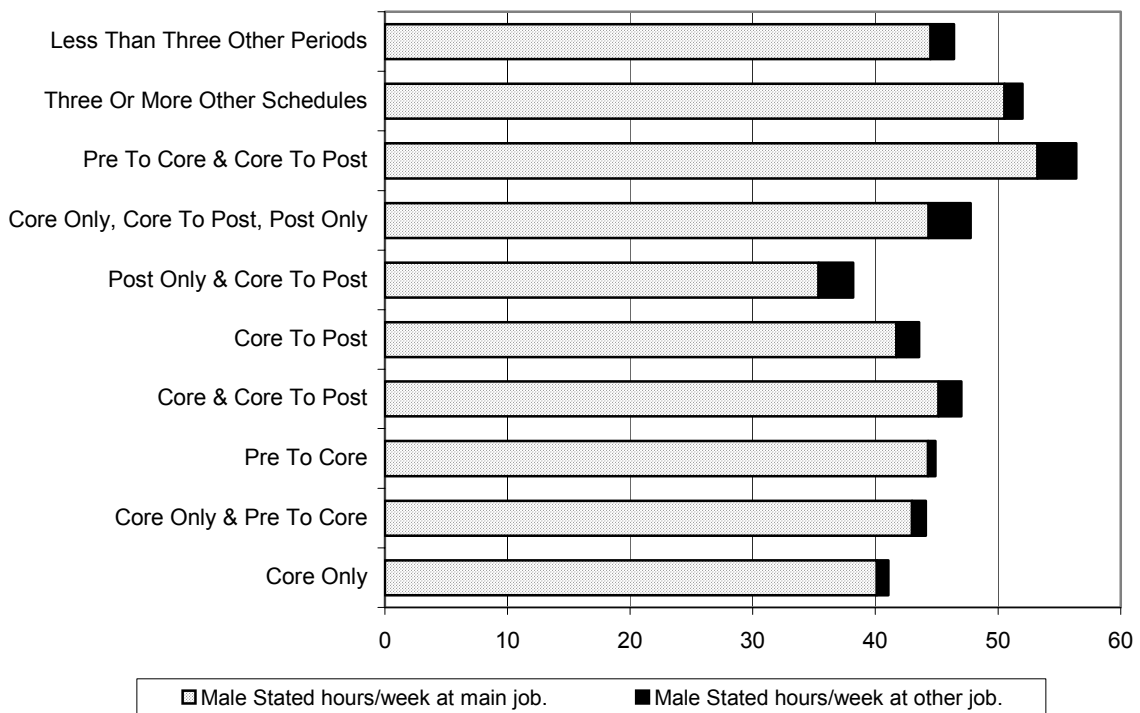


Figure 14. Stated main and other job hours by work arrangement: Canada (Females, 1992)

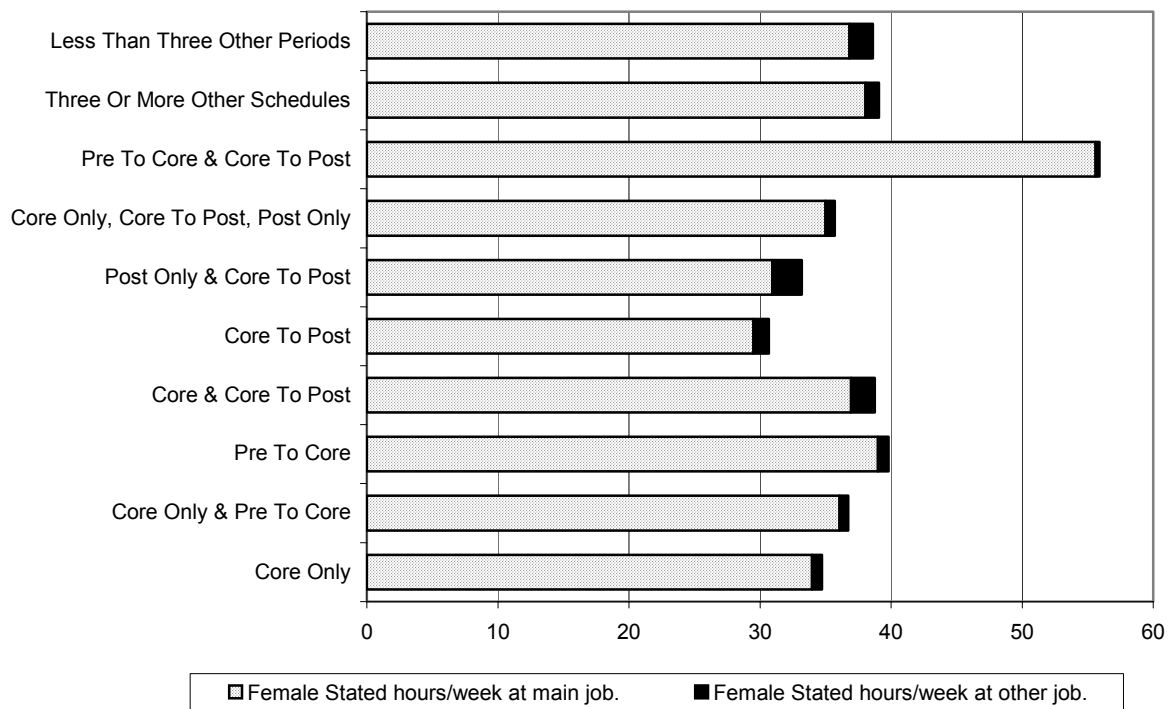


Figure 15. Multiple comparisons of average weekly hour estimates of respondents

	Core only	Core & Pre-to-core	Pre-to-core	Core and Core-to-post	Core-to-post	Post only and Core-to-post	Core only, Core-to-post, Post only	Pre-to-core & Core-to-post	Three or more other schedules	Less than three other periods
Core only										
Core only and Pre-to-core	X									
Pre-to-core	X									
Core and Core-to-post	X									
Core-to-post										
Post only and Core-to-post										
Core only, Core-to-post, Post only										
Pre-to-core and Core-to-post	X	X	X	X	X	X	X			
Three or more other schedules	X	X			X					
Less than three other periods	X							X		

The "X" denotes a significant relationship at the 0.05 confidence level

Figure 16. Multiple comparisons of average paid weekly hours (derived from the diary)

	Core only	Core & Pre-to-core	Pre-to-core	Core & Core-to-post	Core-to-post	Post only & Core-to-post	Core only, Core-to-post, Post only	Pre-to-core & Core-to-post	Three or more other schedules	Less than three other periods
Core only										
Core only and Pre-to-core	X									
Pre-to-core	X									
Core and Core-to-post	X	X	X							
Core-to-post		X		X						
Post only and Core-to-post	X	X	X	X	X					
Core only, Core-to-post, Post only	X					X				
Pre-to-Core and Core-to-post	X	X	X	X	X	X	X			
Three or more other schedules	X	X	X	X	X	X	X	X		
Less than three other periods	X					X		X	X	

The "X" denotes a significant relationship at the 0.05 confidence level

Conclusions

The analysis above barely touches the surface of the work that can be, and needs to be, done to understand working arrangements. It shows both the difficulties and the promise attendant with using time-diary data to explore work arrangements. Clearly work routines are far from being tightly circumscribed. Differing groups exhibit differing patterns. These patterns can be explored in terms of both demographics and job characteristics. As work proceeds, we will be able to better understand how work patterns are shaped and constrained. The patterns explored here have been daily patterns for individuals. A more complete analysis requires exploring working patterns over longer periods. The following section discusses a number of issues that must be considered as the study of work arrangements develops.

Future directions

Now that we have discussed the view of changing patterns of work offered in existing time-diary data, we can turn to questions of what future directions time-diary research might follow to further expand our understanding of shifting hours of work. Three issues arise in this discussion. First, we shall examine limitations in the evidence that exists in present time-use data. Second, we will comment on the factors that contribute to changing patterns of work, and the degree to which existing diary formats capture these changes. Finally, we will propose recommendations for adjustments to future time-diary studies to enhance our understanding of peoples' employment patterns.

Limitations in the evidence which exist in present time-use data

The clear majority of time-diary studies conducted in industrialized countries thus far have asked respondents to keep diaries for short intervals of one to three days. Providing that a proper random sample of the population has been drawn, that efforts are made to collect diaries from all main segments of the population on all days of the week, and that well-constructed weighting variables correct for imbalances in the population distribution in the final sample, as well as any over- or under-representation of any days of the week in the diary, such studies offer a clear picture of what people in aggregate are likely to be doing on any given day of the week in the studied society.

Nevertheless, we should be cautious in attempting to infer patterns which run over longer cycles from the evidence of the one-to three-day diaries. Work comparing the one-week diary data from the United Kingdom and the Netherlands with shorter interval data from many countries suggests that patterns of individual behaviour are more stable over a full week than over any given day.⁴ That this is the case is not a startling finding. Virtually every aspect of life in industrial societies — from school hours, opening times of government and regulatory agencies, scheduling of television and radio programmes, opening hours of restaurants, libraries, or theatres, scheduling of sporting events, and standard employment contracts — works on weekly cycles. There are significant variants and challenges to this model, however. Shift work and other work routines can span multiple weeks, and in some cases, months. Technological advances, from the VCR to the Internet, have challenged some weekly cycles (such as shopping patterns). Nevertheless, the persistence of phenomenon like weekday rush-hours and rising volumes of people at leisure facilities on Friday nights and Saturdays indicate that weekly cycles will continue to play a significant role in peoples' lives for some time to come.

We must then ask what the one-to three-day diary can and cannot tell us about individual cycles. The day or few-day diary raises a problem of bias caused by left censoring, that is, detection of the end of a spell of activity which begins prior to the starting time of the diary. The model of working times may be only mildly effected in the case of a work episode which begins 30 minutes prior to the start of the diary day; yet, in the case of an episode of work whose last 20 minutes falls into the beginning of the diary period, we are unable to say whether the paid employment constitutes the end of a ten-hour shift or a 30-minute session during which someone wrote down a good idea for work which occurred to them during sleep, a good meal, a soothing bath, or so forth. Likewise, we face similar problems from right censoring, or spells of activity that begin just before the finishing time of the diary. (Some countries have attempted to circumvent this problem by starting the diary day at 04:00, assuming that most people would be asleep at this point. Whether this is actually the case remains to be tested, however.)

Extrapolating from one- to three-day diaries to full week periods raises three key dilemmas. First, we could not correct for censoring biases with weights. In contrast to the demographic distribution of the population, which is more or less known from governmental and UN sources, or the distribution of the days of the week during the study period, which we know precisely, we do not know if hospital doctors, journalists, factory assemblers working periodic late shifts, or other groups of people with employment spells outside the “traditional working day” were more or less likely to complete their diaries on days when they worked late shifts. Thus, while we can correct for too many Sunday diaries

⁴ J. Gershuny: *Changing times* (Oxford, Oxford University Press, 2000).

and not enough Friday diaries or too many white women in their forties and not enough black men in their twenties, we cannot correct for occupation-specific censorship biases. Thus, we cannot specify the degree of error implied in projecting one- to three-day diaries over a full work cycle. Secondly, and perhaps more importantly, we would not be able to distinguish between variation in working times at an individual level and variation at a group level. Many individuals have rare occasions (a critical deadline, the child has been sick and they need to catch up on work, an emergency has taken one member out of the workplace at a crucial time, and so forth) when they work non-standard hours. Some individuals prefer working non-standard hours or work in industries requiring such hours. The short-term diary only reflects the proportion of people working non-standard hours on any given day, but cannot reveal if the people detected working these hours are primarily people who always work these hours, primarily people who are working these hours on an exceptional basis, or a more even combination of both groups.

The third complication arises if the analysis seeks to compare results across nations or across time. While most national sample studies begin the diary day at 00:00 and end the diary day at 24:00, some studies use different starting and stopping times, such as 04:00 to 04:00 used in the 1992 Canadian study. Some countries continue to use less than full 24-hour periods in diaries (Spain 1996, covering 06:00-24:00, or Latvia 1997, covering 04:00-24:00). In cases where the diary starting and stopping times vary across studies, we would expect non-random effects to influence results from censored employment spells. Further research will be required to devise strategies to overcome the problems of cross-national comparison.

Assessing the factors contributing to changing patterns of work

The assessment of the extent to which diaries can provide elements for explaining changing patterns of work needs to be considered in conjunction with the factors contributing to changes in working times. We might begin by observing that people working in some fields of employment traditionally have not worked during the general standard working hours. These fields cover a range of “after work” leisure industries (pubs, bars, restaurants, live entertainment, cinemas, and so forth), security and policing services, and a wide range of emergency services. To an extent, increases in non-traditional working hours reflects increases in demand for these services. The growing world population and the ageing of the population in industrialized countries has led to increased demand on out-of-hours medical assistance. Generally greater affluence and changing trends away from eating meals at home has led to increased demand for restaurant, take-away and ready-prepared meals, increasing employment requirements in the food industry after “traditional working hours”. More fluid social arrangements and increased focus on possession of material goods have led to rising crime rates, increasing demand for out-of-hours security and policing services.

Intensifying competition between businesses and the demands of fickle consumers, whose desires many vary with changes in the weather but who increasingly expect instant gratification, has led businesses to cut costs by reducing the lengths of contracts, cutting overtime payments, and seeking greater flexibility in hours of work from employees.⁵ At the same time, unions concerned for the health and well-being of employees working long

⁵ K. Purcell, T. Hogarth and C. Simm: *Whose flexibility? The costs and benefits of “non-standard” working arrangements and contractual relations* (York, Joseph Rowntree Foundation/York Publishing Services, 1999).

hours, groups campaigning for family-friendly working environments, and lobbies for the long-term unemployed have succeeded in prodding legislative changes, most notably the EU Working Time Directive, which limit the average hours employers may expect from employees over a year. In consequence, employers increasing offer contracts which include flexi-time (the expectation that the employee will work a certain number of hours in a week, but giving the employee some discretion over the exact times of work and allowing the timing of work to vary across days); zero-hour contracts (where the employee is contracted to complete series of tasks and paid upon task completion but not assigned work hours as such); or annual hours contracts (whereby employees are hired to work an average of a set number of hours per week across the year on the understanding that they be required to work non-standard shifts or double shifts during periods of peak demand for a product or service, then work few or no hours in weeks of slack demand).⁶

Women's movements and increased concern over the status of families has lead to widespread re-examination of the relationship between family and working life. Not only are employers encouraged by social movements and, in some cases, required by legislation to increase the flexibility of working contract arrangements to enable people to attend to needs at home, but employees themselves often seek work hours that fit their personal needs.⁷ In consequence, working mothers who choose to be with their children for as long as possible seek out "mum's shifts", which allow them to work only while the children are at school.⁸ Couples with young children, or families caring for an elderly or disabled member, also increasingly stagger working times to enable one adult member to perform care while the other works.⁹ In consequence, jobs with early starting times or late ending times appeal to a growing sector of the employment market.

Not all workers have the luxury of such choice. Growing flexibility for employers has also meant growing uncertainty and increased long-term unemployment for the workers. Some people find themselves forced to accept non-standard hours of work due to the absence of alternatives.¹⁰ Drives in many governments to cut state expenditure have likewise lead to official assaults on welfare expenditure.¹¹ As improved medical technology and research have enabled more disabled and elderly people to live longer lives, members of these more economically vulnerable groups have also increasingly found themselves pushed into a workforce which is often more willing to accept them if they agree to be highly flexible employees.¹²

The time-diary evidence thus far is only partially able to measure the differing forms of changes in the timing of work. To begin with, virtually no time-diary studies ask about the nature of contractual arrangements. Thus, people employed on a casual basis, moving

⁶ *ibid.*

⁷ *ibid.*

⁸ *ibid.*

⁹ *ibid.*

¹⁰ *ibid.*

¹¹ OECD: *Employment Outlook 1991* (Paris, 1991); OECD: *The OECD jobs study: Evidence and explanations; Part III* (Paris, 1994); OECD: *Implementing the OECD jobs strategy: Member Countries' experience* (Paris, 1997); and OECD: *Employment Outlook 1998* (Paris, 1998).

¹² *ibid.*

regularly from one form of work to another, or people employed on zero-hour, annual hour, or flexi-time contracts cannot be distinguished from people employed on contracts with set shifts and hours. Without this knowledge, it is therefore difficult to measure the extent to which individuals are hired to work non-traditional hours on a regular basis from the extent to which people's non-standard working times reflect the increasing flexibility of the contemporary workplace. Similarly, while a handful of studies ask generic satisfaction with working hours' questions, few seek to determine any sense of the motivation which people have to work these hours. A more standardized cross-national battery of questions determining the extent to which people chose to vary hours or are forced to vary hours would usefully address this issue. To get a perspective on the extent to which whole households influence hours of work, particularly in households which have caring responsibilities, diaries should be collected from all adult members of the household to facilitate analysis of the extent to which household members distribute the balance of paid and unpaid work, and to see if working times are staggered around caring responsibilities.

Recommendations for future time-diary research

Future research into people's activities in the late night and early morning is required in order to determine the most appropriate cut-off point between the end of post-core working hours and pre-core working hours. This research will need to determine if a standard which applies to many countries can be devised, or if a standard should be set in relation to each country. Future research will also need to further explore issues in making studies of core working hours more comparable across country.

- When possible, weekly work-cycle information should be collected. Time diaries necessitate a trade-off between more detail from weekly diaries but lower response rates, the limited detail from one-day diaries with higher response rates. The EUROSTAT Harmonised Time Diary project may offer a solution. The harmonized diary format recommends that member States conducting time-diary studies ask respondents for detailed activity recording for one day and to keep a shorter and less detailed record of main activities for the full week (noting the timing of transitions between sleep, personal care, unpaid work, paid work, and other time with no specific information on the activities at each point of transition). Such a format potentially offers a more cost-effective method for distinguishing occasional variation in working times from regular non-standard work without compromising response rates.
- Demographic questionnaires accompanying time-diary data should include a small number of questions asking about the nature of employment contracts, including contractual arrangements about total hours and timing of work, as well as for respondents' usual working times.
- Demographic questionnaires should also include a question about the motivations to work the hours which are worked for paid employment along the lines of the following:

I would like to know why you work the hours you presently work. Could you please tell me if any of the following reasons explain why you work these hours? You may choose as many answers as apply to you.

- a. I had no choice. My employer requires these hours.
- b. No other suitable job was available.
- c. These hours enable me to share responsibilities for caring for a child or adult with other members of my household.

-
- d. I expect to work these hours in my field of employment.
 - e. These hours enable me to be home when my children are at home.
 - f. I like working these hours.
 - g. These hours enable me to participate in a sport, hobby or voluntary activity.
 - h. These hours enable me to continue working at my other job.
 - i. These hours allow me to attend my classes or training.
 - j. These hours make it easier or cheaper for me to get to and from work.
 - k. Other (please explain)
- When possible, diaries should be collected throughout the year to properly account both for seasonal change and for the effects of zero-hours or annual hours contracts.
 - When possible, time-diary studies could accompany an extra questionnaire to a selected sub-sample of households with caring responsibilities (whether for children, disabled members, frail elderly parents, or animals) to determine the extent to which working times are fitted around caring responsibilities. Some analysis of this question can be made if diaries are collected from all adult household members.
 - The problem of left-censored and right-censored data could be solved by including two additional supplementary questions with the diary: “What time did you start the main activity you were doing during the first time slot of your diary”, and “What time did you stop doing the main activity you were doing in the last time slot of your diary and start doing something else?”

Appendix A: Data description, selected time-use data sets used for analysis

Question	Norway 1980	Norway 1990-91	Sweden 1990-91	Netherlands 1995	Canada 1992
Age of respondent	16-74	16-79	(20-64)	14-65	15-99
Time of year	Full year	Full year	Mid September to May		December
Yesterday or tomorrow interviews	Tomorrow	Tomorrow	Tomorrow		Yesterday
Number of days	2	2	2: one weekday and one day during the weekend	7	1
Timing of diary day	24 hours All days of the week	24 hours All days of the week	24 hours (starting 4 a.m.) 50% weekdays 50% weekends	24 hours	24 hours (4 a.m. to 4 a.m.)
Convenient or designated day		Designated	Designated (at random)		Designated
Recall period	Fill in the diary several times during the day	Fill in the diary several times during the day	Fill in the diary in the course of the designated day		48 hours
Interview modes	Introductory interview with delivery of the diary and explanation Partial self completion Short visit of the interviewer after the diary period with completion of the diary and final interview	Introductory interview with delivery of the diary and explanation Partial self completion Short visit of the interviewer after the diary period with completion of the diary and final interview	Personal interview Explanation Delivery of 2 tomorrow time diaries to fill out during the designated days Mail back Examination of the diaries and phone call to the respondent if necessary		Diary and questionnaire
Open or fixed interval diary	Fixed: 15 minutes Between midnight and 6:00 a.m.: 30 minutes	Fixed: 15 minutes Between midnight and 6:00 a.m.: 30 minutes	Fixed: 10 minutes Between midnight and 5:00 a.m.: 30 minutes		Open
Diary content	Primary activity Secondary activity With whom Where	Primary activity Secondary activity With whom Where	Primary activity Secondary activity With whom Where (only beginning and end of day)	Primary activity Where With whom	Primary activity Person present Where

Appendix A (continued)

Question	Norway 1980	Norway 1990-91	Sweden 1990-91	Netherlands 1995	Canada 1992
Activity reporting	Own words Later coded by CBS	Own words Later coded by CBS	Own words		Own words
Activity coding	97 activities	122 activities	See Norwegian activity code	264 activities	Open 166 activities
With whom coding	Alone Household member Other persons	Up to 5 members of the household Four different groups of persons from outside the household: relatives, colleagues, friends and others Alone	Alone Household members one by one Others		7 variables contact (with whom or in the presence of whom the activity takes place) with any combination of 1 = Alone, 2 = Family, 3 = Friends, 4 = Others, 9 = Missing
Location coding	0 = At home 1 = At home (around) 2 = Workplace 3 = At other home 4 = Other place 5 = Public transport 6 = Private car 7 = Bicycle 8 = Walk 9 = Unknown means of transportation	At home in own dwelling On own property At work Private visits Other places Time spent in the local community	At home or in the surroundings At summer cottage in other private homes At work Elsewhere	Home In local community outside local community	Home, work, other's home, other place
Travelling coding		Means of transportation	On foot By bicycle By car By public transport Other		Car driver, passenger, walk, bus and subway, bicycle, other
Oversample		Additional sample of persons 60+ and in particular married persons	Single mothers with children living at home 307 (gross) 321 (net)		No
Response rate		64%	About 75%		77%
Sampling unit	Individual	Individual	Individual		Household
Sampling frame			Total population	National study	National
Sampling method	Two-stage random	Random	Random		Random digit dialling (27,000 numbers to obtain 10,000)
Sampling size	5,049 persons	5,000 persons	4,881 persons (gross) 3,638 persons (net) + oversample	1990 = 3,415 1995 = 3,227	12,675 households (gross) 8,996 (net)

Appendix B: Tables

Table 6A. Work time arrangements among employed workers, gender and age groups: Canada (1992)

Age group Work time arrangements	Panel A: Male												Panel B: Female																																																																																																												
	15-24				25-44				45-64				65 and up				15-24				25-44				45-64				65 and up				Group total																																																																																								
	Per cent in age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement																																																																																							
Core only	39.5	6.7	35.5	28.7	33.9	9.8	50.0	1.4	35.9	46.6	44.6	7.7	55.1	35.6	43.1	9.8	37.5	0.4	50.7	53.4	14.6	5.5	13.9	19.5	22.7	22.7	11.2	6.3	0.1	15.8	36.3	3.8	4.0	4.6	18.1	9.9	13.7	12.5	0.8	5.7	36.5	10.4	9.8	6.0	21.4	8.5	10.5	18.8	1.1	7.4	42.8	12.3	14.7	7.2	32.3	3.8	6.0	18.8	1.4	7.4	54.4	3.8	8.3	3.3	26.4	3.8	10.7	0.0	0.0	3.4	45.5	0.8	1.8	3.4	30.0	3.2	10.0	0.0	0.0	2.9	41.8	0.4	1.4	1.1	14.9	0.6	2.7	0.0	0.0	0.9	18.9	1.5	4.0	1.9	19.0	1.7	6.0	0.0	0.0	1.8	29.0	7.7	9.9	3.5	16.8	2.6	4.5	6.3	0.5	4.0	31.7	100.0	7.2	100.0	27.5	100.0	9.6	27.5	0.4	100.0	44.8
Core only and Pre-to-core	14.8	5.5	23.9	42.0	25.3	15.9	4.8	0.3	22.6	63.7	14.6	5.5	13.9	19.5	22.7	11.2	6.3	0.1	15.8	36.3	3.8	4.0	4.6	18.1	9.9	13.7	12.5	0.8	5.7	36.5	10.4	9.8	6.0	21.4	8.5	10.5	18.8	1.1	7.4	42.8	12.3	14.7	7.2	32.3	3.8	6.0	18.8	1.4	7.4	54.4	3.8	8.3	3.3	26.4	3.8	10.7	0.0	0.0	3.4	45.5	0.8	1.8	3.4	30.0	3.2	10.0	0.0	0.0	2.9	41.8	0.4	1.4	1.1	14.9	0.6	2.7	0.0	0.0	0.9	18.9	1.5	4.0	1.9	19.0	1.7	6.0	0.0	0.0	1.8	29.0	7.7	9.9	3.5	16.8	2.6	4.5	6.3	0.5	4.0	31.7	100.0	7.2	100.0	27.5	100.0	9.6	27.5	0.4	100.0	44.8											
Pre-to-core	8.6	8.8	7.3	35.7	9.3	16.5	14.3	2.4	8.0	63.5	14.6	5.5	13.9	19.5	22.7	11.2	6.3	0.1	15.8	36.3	3.8	4.0	4.6	18.1	9.9	13.7	12.5	0.8	5.7	36.5	10.4	9.8	6.0	21.4	8.5	10.5	18.8	1.1	7.4	42.8	12.3	14.7	7.2	32.3	3.8	6.0	18.8	1.4	7.4	54.4	3.8	8.3	3.3	26.4	3.8	10.7	0.0	0.0	3.4	45.5	0.8	1.8	3.4	30.0	3.2	10.0	0.0	0.0	2.9	41.8	0.4	1.4	1.1	14.9	0.6	2.7	0.0	0.0	0.9	18.9	1.5	4.0	1.9	19.0	1.7	6.0	0.0	0.0	1.8	29.0	7.7	9.9	3.5	16.8	2.6	4.5	6.3	0.5	4.0	31.7	100.0	7.2	100.0	27.5	100.0	9.6	27.5	0.4	100.0	44.8											
Core and Core-to-post	9.4	8.7	7.8	34.8	8.0	12.7	7.1	1.1	8.0	57.2	14.6	5.5	13.9	19.5	22.7	11.2	6.3	0.1	15.8	36.3	3.8	4.0	4.6	18.1	9.9	13.7	12.5	0.8	5.7	36.5	10.4	9.8	6.0	21.4	8.5	10.5	18.8	1.1	7.4	42.8	12.3	14.7	7.2	32.3	3.8	6.0	18.8	1.4	7.4	54.4	3.8	8.3	3.3	26.4	3.8	10.7	0.0	0.0	3.4	45.5	0.8	1.8	3.4	30.0	3.2	10.0	0.0	0.0	2.9	41.8	0.4	1.4	1.1	14.9	0.6	2.7	0.0	0.0	0.9	18.9	1.5	4.0	1.9	19.0	1.7	6.0	0.0	0.0	1.8	29.0	7.7	9.9	3.5	16.8	2.6	4.5	6.3	0.5	4.0	31.7	100.0	7.2	100.0	27.5	100.0	9.6	27.5	0.4	100.0	44.8											
Core-to-post	9.4	11.1	5.1	28.6	2.7	5.5	2.4	0.5	5.0	45.6	14.6	5.5	13.9	19.5	22.7	11.2	6.3	0.1	15.8	36.3	3.8	4.0	4.6	18.1	9.9	13.7	12.5	0.8	5.7	36.5	10.4	9.8	6.0	21.4	8.5	10.5	18.8	1.1	7.4	42.8	12.3	14.7	7.2	32.3	3.8	6.0	18.8	1.4	7.4	54.4	3.8	8.3	3.3	26.4	3.8	10.7	0.0	0.0	3.4	45.5	0.8	1.8	3.4	30.0	3.2	10.0	0.0	0.0	2.9	41.8	0.4	1.4	1.1	14.9	0.6	2.7	0.0	0.0	0.9	18.9	1.5	4.0	1.9	19.0	1.7	6.0	0.0	0.0	1.8	29.0	7.7	9.9	3.5	16.8	2.6	4.5	6.3	0.5	4.0	31.7	100.0	7.2	100.0	27.5	100.0	9.6	27.5	0.4	100.0	44.8											
Post only and Core-to-post	4.3	9.1	3.4	34.7	2.5	9.1	4.8	1.7	3.4	54.5	14.6	5.5	13.9	19.5	22.7	11.2	6.3	0.1	15.8	36.3	3.8	4.0	4.6	18.1	9.9	13.7	12.5	0.8	5.7	36.5	10.4	9.8	6.0	21.4	8.5	10.5	18.8	1.1	7.4	42.8	12.3	14.7	7.2	32.3	3.8	6.0	18.8	1.4	7.4	54.4	3.8	8.3	3.3	26.4	3.8	10.7	0.0	0.0	3.4	45.5	0.8	1.8	3.4	30.0	3.2	10.0	0.0	0.0	2.9	41.8	0.4	1.4	1.1	14.9	0.6	2.7	0.0	0.0	0.9	18.9	1.5	4.0	1.9	19.0	1.7	6.0	0.0	0.0	1.8	29.0	7.7	9.9	3.5	16.8	2.6	4.5	6.3	0.5	4.0	31.7	100.0	7.2	100.0	27.5	100.0	9.6	27.5	0.4	100.0	44.8											
Core only, Core-to-post, Post only	2.7	6.4	3.2	35.5	3.6	14.5	4.8	1.8	3.3	58.2	14.6	5.5	13.9	19.5	22.7	11.2	6.3	0.1	15.8	36.3	3.8	4.0	4.6	18.1	9.9	13.7	12.5	0.8	5.7	36.5	10.4	9.8	6.0	21.4	8.5	10.5	18.8	1.1	7.4	42.8	12.3	14.7	7.2	32.3	3.8	6.0	18.8	1.4	7.4	54.4	3.8	8.3	3.3	26.4	3.8	10.7	0.0	0.0	3.4	45.5	0.8	1.8	3.4	30.0	3.2	10.0	0.0	0.0	2.9	41.8	0.4	1.4	1.1	14.9	0.6	2.7	0.0	0.0	0.9	18.9	1.5	4.0	1.9	19.0	1.7	6.0	0.0	0.0	1.8	29.0	7.7	9.9	3.5	16.8	2.6	4.5	6.3	0.5	4.0	31.7	100.0	7.2	100.0	27.5	100.0	9.6	27.5	0.4	100.0	44.8											
Pre-to-core and Core-to-post	1.6	5.4	3.3	54.1	3.4	20.3	2.4	1.4	3.1	81.1	14.6	5.5	13.9	19.5	22.7	11.2	6.3	0.1	15.8	36.3	3.8	4.0	4.6	18.1	9.9	13.7	12.5	0.8	5.7	36.5	10.4	9.8	6.0	21.4	8.5	10.5	18.8	1.1	7.4	42.8	12.3	14.7	7.2	32.3	3.8	6.0	18.8	1.4	7.4	54.4	3.8	8.3	3.3	26.4	3.8	10.7	0.0	0.0	3.4	45.5	0.8	1.8	3.4	30.0	3.2	10.0	0.0	0.0	2.9	41.8	0.4	1.4	1.1	14.9	0.6	2.7	0.0	0.0	0.9	18.9	1.5	4.0	1.9	19.0	1.7	6.0	0.0	0.0	1.8	29.0	7.7	9.9	3.5	16.8	2.6	4.5	6.3	0.5	4.0	31.7	100.0	7.2	100.0	27.5	100.0	9.6	27.5	0.4	100.0	44.8											
Three or more other schedules	1.6	4.0	3.7	46.0	4.6	20.0	2.4	1.0	3.6	71.0	14.6	5.5	13.9	19.5	22.7	11.2	6.3	0.1	15.8	36.3	3.8	4.0	4.6	18.1	9.9	13.7	12.5	0.8	5.7	36.5	10.4	9.8	6.0	21.4	8.5	10.5	18.8	1.1	7.4	42.8	12.3	14.7	7.2	32.3	3.8	6.0	18.8	1.4	7.4	54.4	3.8	8.3	3.3	26.4	3.8	10.7	0.0	0.0	3.4	45.5	0.8	1.8	3.4	30.0	3.2	10.0	0.0	0.0	2.9	41.8	0.4	1.4	1.1	14.9	0.6	2.7	0.0	0.0	0.9	18.9	1.5	4.0	1.9	19.0	1.7	6.0	0.0	0.0	1.8	29.0	7.7	9.9	3.5	16.8	2.6	4.5	6.3	0.5	4.0	31.7	100.0	7.2	100.0	27.5	100.0	9.6	27.5	0.4	100.0	44.8											
Less than three other schedules	8.2	10.4	6.9	42.1	6.6	14.4	7.1	1.5	7.0	68.3	14.6	5.5	13.9	19.5	22.7	11.2	6.3	0.1	15.8	36.3	3.8	4.0	4.6	18.1	9.9	13.7	12.5	0.8	5.7	36.5	10.4	9.8	6.0	21.4	8.5	10.5	18.8	1.1	7.4	42.8	12.3	14.7	7.2	32.3	3.8	6.0	18.8	1.4	7.4	54.4	3.8	8.3	3.3	26.4	3.8	10.7	0.0	0.0	3.4	45.5	0.8	1.8	3.4	30.0	3.2	10.0	0.0	0.0	2.9	41.8	0.4	1.4	1.1	14.9	0.6	2.7	0.0	0.0	0.9	18.9	1.5	4.0	1.9	19.0	1.7	6.0	0.0	0.0	1.8	29.0	7.7	9.9	3.5	16.8	2.6	4.5	6.3	0.5	4.0	31.7	100.0	7.2	100.0	27.5	100.0	9.6	27.5	0.4	100.0	44.8											
Total	100.0	7.2	100.0	34.5	100.0	12.3	100.0	1.2	100.0	55.2	100.0	7.2	100.0	27.5	100.0	9.6	27.5	0.4	100.0	44.8	100.0	7.2	100.0	27.5	100.0	9.6	27.5	0.4	100.0	44.8	100.0	7.2	100.0	27.5	100.0	9.6	27.5	0.4	100.0	44.8	100.0	7.2	100.0	27.5	100.0	9.6	27.5	0.4	100.0	44.8	100.0	7.2	100.0	27.5	100.0	9.6	27.5	0.4	100.0	44.8																																																													

Table 6B. Work time arrangements among employed workers, gender and age groups: Netherlands (1995)

Work time arrangements	Panel A: Male												Panel B: Female																							
	15-24				25-44				45-64				65 and up				15-24				25-44				45-64				65 and up				Group total			
	Per cent in age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement	Per cent in work age group	Per cent in work arrangement				
Core only	50.82	3.84	32.22	45.45	32.22	48.45	11.65	66.67	0.50	46.70	48.20	70.83	6.32	35.32	70.90	69.49	10.16	0.00	0.00	70.37	51.80	1.39	2.17	4.35	0.50	0.85	2.17	0.00	0.00	0.67	8.70					
Core only and Pre-to-core	3.28	4.35	63.04	5.07	63.04	5.67	23.91	0.00	0.00	5.04	91.30	13.89	4.26	17.02	9.95	5.08	2.55	0.00	0.00	0.67	8.70	19.67	5.11	23.95	12.77	12.77	0.00	0.00	9.43	23.83						
Pre-to-core	19.67	5.11	58.30	23.95	58.30	15.46	12.77	0.00	0.00	21.49	76.17	1.39	3.45	24.14	1.74	0.85	3.45	0.00	0.00	0.67	8.70	Core and Core-to-post	3.28	6.90	51.72	10.34	0.00	2.40	68.97							
Core and Core-to-post	3.28	6.90	51.72	2.62	51.72	1.55	10.34	0.00	0.00	2.40	68.97	Core-to-post	11.48	7.07	42.42	7.34	7.22	14.14	0.00	0.00	7.56	63.64	Core-to-post	11.48	7.07	42.42	14.14	0.00	7.56	63.64						
Core-to-post	11.48	7.07	42.42	7.34	42.42	7.22	14.14	0.00	0.00	7.56	63.64	Post only and Core-to-post	3.28	4.55	27.27	2.10	4.12	18.18	16.67	2.27	2.76	52.27	Post only and Core-to-post	3.28	4.55	27.27	2.10	4.12	18.18	16.67	2.27	2.76	52.27			
Post only and Core-to-post	3.28	4.55	27.27	2.10	27.27	4.12	18.18	0.00	0.00	7.08	61.46	Core only, Core-to-post, Post only	0.00	0.00	40.63	6.82	10.31	20.83	0.00	0.00	7.08	61.46	Core only, Core-to-post, Post only	0.00	0.00	40.63	6.82	10.31	20.83	0.00	0.00	7.08	61.46			
Core only, Core-to-post, Post only	0.00	0.00	40.63	6.82	40.63	10.31	20.83	0.00	0.00	7.08	61.46	Pre-to-core and Core-to-post	3.28	20.00	50.00	0.87	0.52	10.00	0.00	0.00	0.96	80.00	Pre-to-core and Core-to-post	3.28	20.00	50.00	0.87	0.52	10.00	0.00	0.00	0.96	80.00			
Pre-to-core and Core-to-post	3.28	20.00	50.00	0.87	50.00	0.52	10.00	0.00	0.00	0.96	80.00	Three or more other schedules	1.64	3.23	51.61	2.80	3.09	19.35	16.67	3.23	2.88	77.42	Three or more other schedules	1.64	3.23	51.61	2.80	3.09	19.35	16.67	3.23	2.88	77.42			
Three or more other schedules	1.64	3.23	51.61	2.80	51.61	3.09	19.35	0.00	0.00	2.88	77.42	Less than three other schedules	3.28	6.67	56.67	2.97	3.61	23.33	0.00	0.00	3.12	86.67	Less than three other schedules	3.28	6.67	56.67	2.97	3.61	23.33	0.00	0.00	3.12	86.67			
Less than three other schedules	3.28	6.67	56.67	2.97	56.67	3.61	23.33	0.00	0.00	3.12	86.67	Total	100.00	40.08	100.00	13.59	100.00	100.00	0.42	100.00	58.37	Total	100.00	40.08	100.00	13.59	100.00	100.00	0.42	100.00	58.37					
Total	100.00	4.27	40.08	100.00	40.08	100.00	13.59	100.00	0.42	100.00	58.37	Total	100.00	40.08	100.00	13.59	100.00	100.00	0.42	100.00	58.37	Total	100.00	40.08	100.00	13.59	100.00	100.00	0.42	100.00	58.37					

Table 7A. Work time arrangements among employed workers, gender and marital status: Canada (1992)

Panel A: Male						
Marital status <i>Work time arrangements</i>	Not married		Married		Group total	
	<i>Per cent of not married</i>	<i>Per cent in work arrangement</i>	<i>Per cent of married</i>	<i>Per cent in work arrangement</i>	<i>Per cent of all males</i>	<i>Per cent in work arrangement</i>
Core only	34.13	28.27	39.27	18.36	35.98	46.63
Core only and Pre-to-core	24.48	44.11	19.21	19.54	22.58	63.65
Pre-to-core	8.21	41.37	7.77	22.09	8.05	63.45
Core and Core-to-post	8.21	37.32	7.77	19.93	8.05	57.25
Core-to-post	4.15	23.96	6.64	21.66	5.05	45.62
Post only and Core-to-post	3.11	32.23	3.81	22.31	3.36	54.55
Core only, Core-to-post, Post only	3.35	38.18	3.11	20.00	3.26	58.18
Pre-to-core and Core-to-post	3.27	55.41	2.68	25.68	3.06	81.08
Three or more other schedules	3.83	48.00	3.25	23.00	3.62	71.00
Less than three other schedules	7.26	45.27	6.50	22.89	6.98	68.16
Total	100.00	35.24	100.00	19.90	100.00	55.14

Panel B: Female						
Marital status <i>Work time arrangements</i>	Not married		Married		Group total	
	<i>Per cent of not married</i>	<i>Per cent in work arrangement</i>	<i>Per cent of married</i>	<i>Per cent in work arrangement</i>	<i>Per cent of all females</i>	<i>Per cent in work arrangement</i>
Core only	52.82	33.42	47.34	19.95	50.63	53.37
Core only and Pre-to-core	15.24	20.98	16.77	15.37	15.85	36.35
Pre-to-core	6.26	24.10	4.86	12.45	5.70	36.55
Core and Core-to-post	6.47	22.46	8.78	20.29	7.39	42.75
Core-to-post	6.68	29.49	8.46	24.88	7.39	54.38
Post only and Core-to-post	3.13	24.79	3.92	20.66	3.45	45.45
Core only, Core-to-post, Post only	3.34	29.09	2.19	12.73	2.88	41.82
Pre-to-core and Core-to-post	0.52	6.76	1.41	12.16	0.88	18.92
Three or more other schedules	1.46	14.00	2.35	15.00	1.82	29.00
Less than three other schedules	4.07	19.40	3.92	12.44	4.01	31.84
Total	100.00	26.93	100.00	17.93	100.00	44.86

Table 7B. Work time arrangements among employed workers, gender and marital status: Netherlands (1995)

Marital status <i>Work time arrangements</i>	Panel A: Male					
	Not married		Married		Group total	
	<i>Per cent of not married</i>	<i>Per cent in work arrangement</i>	<i>Per cent of married</i>	<i>Per cent in work arrangement</i>	<i>Per cent of all males</i>	<i>Per cent in work arrangement</i>
Core only	50.76	12.44	45.50	35.82	46.75	48.26
Core only and Pre-to-core	3.05	13.04	5.69	78.26	5.06	91.30
Pre-to-core	17.26	14.47	22.91	61.70	21.57	76.17
Core and Core-to-post	4.57	32.14	1.58	35.71	2.29	67.86
Core-to-post	9.14	18.37	6.95	44.90	7.47	63.27
Post only and Core-to-post	2.54	11.36	2.84	40.91	2.77	52.27
Core only, Core-to-post, Post only	6.60	13.54	7.27	47.92	7.11	61.46
Pre-to-core and Core-to-post	1.52	30.00	0.79	50.00	0.96	80.00
Three or more other schedules	1.52	9.68	3.32	67.74	2.89	77.42
Less than three other schedules	3.05	20.00	3.16	66.67	3.13	86.67
Total	100.00	13.85	100.00	44.51	100.00	58.37

Marital status <i>Work time arrangements</i>	Panel B: Female					
	Not married		Married		Group total	
	<i>Per cent of not married</i>	<i>Per cent in work arrangement</i>	<i>Per cent of married</i>	<i>Per cent in work arrangement</i>	<i>Per cent of all females</i>	<i>Per cent in work arrangement</i>
Core only	68.42	14.55	71.02	37.19	70.27	51.74
Core only and Pre-to-core	1.75	6.52	0.24	2.17	0.68	8.70
Pre-to-core	6.43	4.68	10.69	19.15	9.46	23.83
Core and Core-to-post	0.58	3.57	1.90	28.57	1.52	32.14
Core-to-post	7.02	12.24	5.70	24.49	6.08	36.73
Post only and Core-to-post	3.51	13.64	3.56	34.09	3.55	47.73
Core only, Core-to-post, Post only	8.77	15.63	5.23	22.92	6.25	38.54
Pre-to-core and Core-to-post	1.17	20.00	0.00	0.00	0.34	20.00
Three or more other schedules	2.34	12.90	0.71	9.68	1.18	22.58
Less than three other schedules	0.00	0.00	0.95	13.33	0.68	13.33
Total	100.00	12.03	100.00	29.61	100.00	41.63

Table 7C. Work time arrangements among employed workers, gender and marital status: Sweden (1991)

Panel A: Male						
Marital status	Not married		Married		Group total	
Work time arrangements	Per cent of not married	Per cent in work arrangement	Per cent of married	Per cent in work arrangement	Per cent of all males	Per cent in work arrangement
Core only	30.10	13.19	27.08	37.45	27.80	50.64
Core only and Pre-to-core	2.67	28.95	1.46	50.00	1.75	78.95
Pre-to-core	16.75	20.35	11.15	42.77	12.50	63.13
Core and Core-to-post	10.19	10.34	13.77	44.09	12.91	54.43
Core-to-post	18.93	11.17	22.08	41.12	21.32	52.29
Post only and Core-to-post	5.34	12.72	6.00	45.09	5.84	57.80
Core only, Core-to-post, Post only	4.37	10.47	6.31	47.67	5.84	58.14
Pre-to-core and Core-to-post	1.21	16.13	1.46	61.29	1.40	77.42
Three or more other schedules	0.97	8.89	2.15	62.22	1.87	71.11
Less than three other schedules	9.47	20.00	8.54	56.92	8.76	76.92
Total	100.00	13.57	100.00	42.81	100.00	56.37

Panel B: Female						
Marital status	Not married		Married		Group total	
Work time arrangements	Per cent of not married	Per cent in work arrangement	Per cent of married	Per cent in work arrangement	Per cent of all females	Per cent in work arrangement
Core only	28.30	10.30	37.40	39.00	35.00	49.40
Core only and Pre-to-core	0.90	7.90	0.50	13.20	0.60	21.10
Pre-to-core	9.60	9.70	9.40	27.10	9.40	36.90
Core and Core-to-post	15.70	13.30	13.30	32.30	14.00	45.60
Core-to-post	29.70	14.60	23.50	33.10	25.10	47.70
Post only and Core-to-post	4.40	8.70	5.90	33.50	5.50	42.20
Core only, Core-to-post, Post only	5.20	10.50	5.50	31.40	5.40	41.90
Pre-to-core and Core-to-post	0.90	9.70	0.40	12.90	0.50	22.60
Three or more other schedules	1.50	11.10	0.80	17.80	1.00	28.90
Less than three other schedules	3.80	6.70	3.30	16.40	3.40	23.10
Total	100.00	11.30	100.00	32.30	100.00	43.60

Table 7D. Work time arrangements among employed workers, gender and marital status: Norway (1990)

Marital status <i>Work time arrangements</i>	Panel A: Male					
	Not married		Married		Group total	
	<i>Per cent of not married</i>	<i>Per cent in work arrangement</i>	<i>Per cent of married</i>	<i>Per cent in work arrangement</i>	<i>Per cent of all males</i>	<i>Per cent in work arrangement</i>
Core only	49.1	20.5	46.6	32.0	47.5	52.5
Core only and Pre-to-core	1.1	42.9	0.6	35.7	0.8	78.6
Pre-to-core	6.3	22.2	7.2	41.8	6.9	64.1
Core and Core-to-post	3.9	21.6	4.4	40.2	4.2	61.9
Core-to-post	21.6	20.4	18.9	29.3	19.9	49.7
Post only and Core-to-post	9.0	21.6	9.5	37.8	9.3	59.5
Core only, Core-to-post, Post only	5.2	16.5	9.0	47.1	7.6	63.5
Pre-to-core and Core-to-post	0.2	20.0	0.5	80.0	0.4	100.0
Three or more other schedules	1.1	19.4	1.4	38.7	1.3	58.1
Less than three other schedules	2.4	30.2	1.9	39.5	2.1	69.8
Total	100.0	20.7	100.0	34.1	100.0	54.8

Marital status <i>Work time arrangements</i>	Panel B: Female					
	Not married		Married		Group total	
	<i>Per cent of not married</i>	<i>Per cent in work arrangement</i>	<i>Per cent of married</i>	<i>Per cent in work arrangement</i>	<i>Per cent of all females</i>	<i>Per cent in work arrangement</i>
Core only	49.1	18.4	54.4	29.2	52.2	47.5
Core only and Pre-to-core			0.4	21.4	0.3	21.4
Pre-to-core	4.0	12.4	5.2	23.5	4.7	35.9
Core and Core-to-post	3.3	16.5	3.0	21.6	3.2	38.1
Core-to-post	29.5	25.0	20.9	25.3	24.4	50.3
Post only and Core-to-post	8.5	18.5	7.1	22.1	7.7	40.5
Core only, Core-to-post, Post only	4.0	11.2	6.2	25.3	5.3	36.5
Pre-to-core and Core-to-post						
Three or more other schedules	0.6	9.7	1.5	32.3	1.1	41.9
Less than three other schedules	1.0	11.6	1.2	18.6	1.1	30.2
Total	100.0	18.6	100.0	26.6	100.0	45.2

Table 7E. Work time arrangements among employed workers, gender and marital status: Norway (1980)

Marital status	Panel A: Male					
	Not married		Married		Group total	
Work time arrangements	Per cent of not married	Per cent in work arrangement	Per cent of married	Per cent in work arrangement	Per cent of all males	Per cent in work arrangement
Core only	39.80	10.10	38.40	20.40	0.70	30.60
Core only and Pre-to-core						
Pre-to-core	1.00	27.30	0.60	36.40	0.70	63.60
Core and Core-to-post	2.50	9.90	1.70	13.60	2.00	23.50
Core-to-post	5.10	18.80	3.50	27.10	4.00	45.90
Post only and Core-to-post	38.50	12.80	40.00	27.80	39.50	40.60
Core only, Core-to-post, Post only	11.10	3.10	14.30	8.40	13.40	11.60
Pre-to-core and Core-to-post						
Three or more other schedules	1.60	13.20	0.50	7.90	0.80	21.10
Less than three other schedules	0.30	4.80	1.10	33.30	0.80	38.10
Total	100.00	8.90	100.00	18.60	100.00	27.50

Marital status	Panel B: Female					
	Not married		Married		Group total	
Work time arrangements	Per cent of not married	Per cent in work arrangement	Per cent of married	Per cent in work arrangement	Per cent of all females	Per cent in work arrangement
Core only	37.10	20.20	32.00	49.20	33.30	69.40
Core only and Pre-to-core			0.20	100.00	0.10	100.00
Pre-to-core	0.30	18.20	0.10	18.20	0.20	36.40
Core and Core-to-post	1.90	16.00	2.60	60.50	2.40	76.50
Core-to-post	2.20	17.60	1.60	36.50	1.80	54.10
Post only and Core-to-post	28.60	20.30	19.50	39.00	21.80	59.40
Core only, Core-to-post, Post only	28.40	17.00	42.20	71.40	38.60	88.40
Pre-to-core and Core-to-post			0.10	100.00	0.00	100.00
Three or more other schedules	0.40	7.90	1.40	71.10	1.20	78.90
Less than three other schedules	1.00	33.30	0.30	28.60	0.50	61.90
Total	100.00	19.00	100.00	53.60	100.00	72.50

Table 7F. Work time arrangements among employed workers, gender and marital status: Netherlands (1990)

Marital status <i>Work time arrangements</i>	Panel A: Male					
	Not married		Married		Group total	
	<i>Per cent of not married</i>	<i>Per cent in work arrangement</i>	<i>Per cent of married</i>	<i>Per cent in work arrangement</i>	<i>Per cent of all males</i>	<i>Per cent in work arrangement</i>
Core only	44.4	4.7	42.2	15.8	42.7	20.5
Core only and Pre-to-core	5.8	5.9	9.8	35.4	8.9	41.4
Pre-to-core	16.3	6.2	21.7	29.1	20.5	35.3
Core and Core-to-post	6.9	10.8	3.5	19.1	4.2	29.7
Core-to-post	11.9	8.0	6.7	15.8	7.8	23.6
Post only and Core-to-post	4.6	6.6	3.6	18.3	3.8	24.8
Core only, Core-to-post, Post only	4.1	5.0	5.2	22.4	4.9	27.4
Pre-to-core and Core-to-post	1.0	5.4	1.5	29.9	1.4	35.4
Three or more other schedules	0.9	3.5	2.0	28.8	1.7	32.3
Less than three other schedules	4.1	7.9	3.9	26.7	3.9	34.5
Total					100.0	25.7

Marital status <i>Work time arrangements</i>	Panel B: Female					
	Not married		Married		Group total	
	<i>Per cent of not married</i>	<i>Per cent in work arrangement</i>	<i>Per cent of married</i>	<i>Per cent in work arrangement</i>	<i>Per cent of all females</i>	<i>Per cent in work arrangement</i>
Core only	67.2	7.2	61.7	16.3	63.3	23.4
Core only and Pre-to-core	3.1	3.2	2.3	5.9	2.5	9.1
Pre-to-core	8.6	3.3	8.5	8.0	8.5	11.3
Core and Core-to-post	3.4	5.4	2.6	10.2	2.9	15.5
Core-to-post	8.0	5.4	11.7	19.6	10.6	24.8
Post only and Core-to-post	3.7	5.3	4.7	17.1	4.4	22.3
Core only, Core-to-post, Post only	3.7	4.5	4.4	13.6	4.2	18.2
Pre-to-core and Core-to-post	0.6	3.4	0.5	7.5	0.6	10.9
Three or more other schedules	0.6	2.5	0.9	9.1	0.8	11.6
Less than three other schedules	1.2	2.4	2.6	12.6	2.2	15.0
Total					100.0	19.8

Table 7G. Work time arrangements among employed workers, gender and marital status: Netherlands (1995)

Marital status <i>Work time arrangements</i>	Panel A: Male					
	Not married		Married		Group total	
	<i>Per cent of not married</i>	<i>Per cent in work arrangement</i>	<i>Per cent of married</i>	<i>Per cent in work arrangement</i>	<i>Per cent of all males</i>	<i>Per cent in work arrangement</i>
Core only	48.9	7.2	46.3	20.7	46.9	27.9
Core only and Pre-to-core	5.9	8.4	6.9	30.0	6.7	38.4
Pre-to-core	15.4	8.1	20.4	32.6	19.1	40.7
Core and Core-to-post	4.6	10.0	3.8	24.9	4.0	35.2
Core-to-post	10.7	9.9	7.2	20.5	8.2	30.7
Post only and Core-to-post	3.3	6.6	3.7	22.4	3.6	29.1
Core only, Core-to-post, Post only	4.7	8.0	4.8	25.0	4.8	33.1
Pre-to-core and Core-to-post	1.2	9.5	1.4	33.3	1.4	42.9
Three or more other schedules	1.5	8.6	1.8	31.3	1.7	39.9
Less than three other schedules	3.8	10.3	3.5	28.6	3.6	39.0
Total					100.0	31.8

Marital status <i>Work time arrangements</i>	Panel B: Female					
	Not married		Married		Group total	
	<i>Per cent of not married</i>	<i>Per cent in work arrangement</i>	<i>Per cent of married</i>	<i>Per cent in work arrangement</i>	<i>Per cent of all females</i>	<i>Per cent in work arrangement</i>
Core only	65.0	8.1	67.1	20.0	66.5	28.2
Core only and Pre-to-core	3.2	3.9	2.5	7.2	2.7	11.1
Pre-to-core	7.1	3.2	9.0	9.6	8.4	12.8
Core and Core-to-post	3.8	6.9	2.9	12.7	3.1	19.5
Core-to-post	10.1	8.0	6.8	12.8	7.8	20.8
Post only and Core-to-post	4.2	7.1	4.1	16.7	4.1	23.8
Core only, Core-to-post, Post only	4.0	5.8	4.5	15.6	4.3	21.3
Pre-to-core and Core-to-post	0.7	4.8	0.4	6.1	0.5	10.9
Three or more other schedules	1.3	6.1	0.9	10.1	1.0	16.2
Less than three other schedules	0.6	1.4	1.8	10.0	1.5	11.4
Total					100.0	22.7

Table 8A. Work time arrangements among employed workers, gender and age of youngest child: Canada (1992)

Age of youngest child Work time arrangements	Panel A: Male						Panel B: Female							
	Pre-school age		School age		None		Pre-school age		School age		None			
	Per cent of total	Per cent in work arrangement	Per cent of total	Per cent in work arrangement	Per cent of total	Per cent in work arrangement	Per cent of total	Per cent in work arrangement	Per cent of total	Per cent in work arrangement	Per cent of total	Per cent in work arrangement		
Core only	36.56	10.23	33.74	7.26	36.33	29.11	35.95	46.60	57.65	11.68	56.98	28.78	50.66	53.40
Core only and Pre-to-core	25.47	15.49	23.01	10.76	21.50	37.45	22.61	63.70	12.38	5.45	12.21	24.82	15.84	36.30
Pre-to-core	9.43	16.06	7.36	9.64	7.74	37.75	8.04	63.45	5.21	6.43	3.78	24.90	5.70	36.55
Core and Core-to-post	5.42	8.33	9.51	11.23	8.57	37.68	8.04	57.25	5.54	6.16	7.85	26.81	7.39	42.75
Core-to-post	4.48	8.76	4.29	6.45	5.44	30.41	5.04	45.62	4.89	6.91	6.40	37.33	7.39	54.38
Post only and Core-to-post	3.54	12.40	2.45	6.61	3.54	35.54	3.36	54.55	4.23	10.74	4.36	22.31	3.44	45.45
Core only, Core-to-post, Post only	2.83	10.91	3.07	9.09	3.46	38.18	3.26	58.18	2.28	6.36	4.07	22.73	2.88	41.82
Pre-to-core and Core-to-post	3.30	18.92	3.07	13.51	2.97	48.65	3.05	81.08	0.33	1.35	1.16	12.16	0.88	18.92
Three or more other schedules	3.30	14.00	5.21	17.00	3.29	40.00	3.62	71.00	1.30	4.00	0.87	22.00	1.82	29.00
Less than three other schedules	5.66	11.88	8.28	13.37	7.17	43.07	7.03	68.32	6.19	9.41	2.33	18.32	4.01	31.68
Total	100.00	11.91	100.00	9.15	100.00	34.09	100.00	55.15	100.00	8.62	100.00	26.57	100.00	44.85

Table 8B. Work time arrangements among employed workers, gender and age of youngest child: Netherlands (1995)

Age of youngest child Work time arrangements	Panel A: Male						Panel B: Female					
	Pre-school age		School age		None		Pre-school age		School age		None	
	Per cent of total arrangement	Per cent in work arrangement	Per cent of total arrangement	Per cent in work arrangement	Per cent of total arrangement	Per cent in work arrangement	Per cent of total arrangement	Per cent in work arrangement	Per cent of total arrangement	Per cent in work arrangement	Per cent of total arrangement	Per cent in work arrangement
Core only	40.59	10.16	48.18	14.25	50.26	23.79	46.70	70.75	16.11	69.84	26.39	70.37
Core only and Pre-to-core	4.46	19.57	5.62	30.43	4.97	41.30	5.04	7.55	2.17	0.98	6.52	0.67
Pre-to-core	29.21	25.11	21.69	22.98	17.28	28.09	21.49	1.89	8.09	9.51	12.34	9.43
Core and Core-to-post	1.49	10.34	2.01	17.24	3.14	41.38	2.40	6.60	3.45	1.97	20.69	1.52
Core-to-post	4.46	9.09	10.04	25.25	7.59	29.29	7.56	5.66	14.14	4.92	15.15	6.06
Post only and Core-to-post	3.47	15.91	2.81	15.91	2.36	20.45	2.76	5.66	9.09	3.61	25.00	3.54
Core only, Core-to-post, Post only	8.91	18.75	5.22	13.54	7.33	29.17	7.08	5.66	9.38	7.21	22.92	6.23
Pre-to-core and Core-to-post	0.99	20.00	0.80	20.00	1.05	40.00	0.96	0.94	10.00	0.33	10.00	0.34
Three or more other schedules	3.47	22.58	1.61	12.90	3.40	41.94	2.88	0.94	9.68	0.98	9.68	1.18
Less than three other schedules	2.97	20.00	4.02	33.33	2.62	33.33	3.12	0.94	3.33	0.66	6.67	0.67
Total	100.00	14.16	100.00	17.45	100.00	26.77	100.00	100.00	12.82	100.00	21.37	100.00
Core only	70.75	9.29	71.04	16.11	69.84	26.39	70.37	51.80	16.11	69.84	26.39	70.37
Core only and Pre-to-core			0.55	2.17	0.98	6.52	0.67	8.70	0.55	0.55	6.52	0.67
Pre-to-core	7.55	3.40	10.38	8.09	9.51	12.34	9.43	23.83	10.38	9.51	12.34	9.43
Core and Core-to-post	1.89	6.90	0.55	3.45	1.97	20.69	1.52	31.03	0.55	1.97	20.69	1.52
Core-to-post	6.60	7.07	7.65	14.14	4.92	15.15	6.06	36.36	7.65	4.92	15.15	6.06
Post only and Core-to-post	5.66	13.64	2.19	9.09	3.61	25.00	3.54	47.73	2.19	3.61	25.00	3.54
Core only, Core-to-post, Post only	5.66	6.25	4.92	9.38	7.21	22.92	6.23	38.54	4.92	7.21	22.92	6.23
Pre-to-core and Core-to-post			0.55	10.00	0.33	10.00	0.34	20.00	0.55	0.33	10.00	0.34
Three or more other schedules	0.94	3.23	1.64	9.68	0.98	9.68	1.18	22.58	1.64	0.98	9.68	1.18
Less than three other schedules	0.94	3.33	0.55	3.33	0.66	6.67	0.67	13.33	0.55	0.66	6.67	0.67
Total	100.00	7.43	100.00	12.82	100.00	21.37	100.00	41.63	7.43	100.00	21.37	100.00

Table 8C. Work time arrangements among employed workers, gender and age of youngest child: Sweden (1991)

Age of youngest child Work time arrangements	Panel A: Male						Panel B: Female								
	Pre-school age		School age		None		Pre-school age		School age		None				
	Per cent of total arrangement	Per cent in work arrangement	Per cent of total arrangement	Per cent in work arrangement	Per cent of total arrangement	Per cent in work arrangement	Per cent of total arrangement	Per cent in work arrangement	Per cent of total arrangement	Per cent in work arrangement	Per cent of total arrangement	Per cent in work arrangement			
Core only	21.71	8.09	28.27	12.66	29.86	29.89	27.80	39.29	10.53	33.25	14.04	34.47	24.79	35.02	49.36
Core only and Pre-to-core	1.14	10.53	0.95	10.53	2.34	57.89	1.75	0.40	2.63	0.76	7.89	0.59	10.53	0.60	21.05
Pre-to-core	15.71	16.22	7.60	9.44	13.50	37.46	12.50	10.32	7.67	10.08	11.80	8.73	17.40	9.43	36.87
Core and Core-to-post	12.00	10.34	14.01	14.53	12.75	29.56	12.91	10.32	6.40	12.59	12.32	16.12	26.85	13.96	45.57
Core-to-post	26.57	13.32	22.33	13.47	18.92	25.50	21.32	22.62	8.17	24.94	14.18	26.18	25.36	25.13	47.71
Post only and Core-to-post	4.29	8.67	7.60	18.50	5.63	30.64	5.84	6.35	9.25	6.55	15.03	4.59	17.92	5.51	42.20
Core only, Core-to-post, Post only	6.86	13.95	7.60	18.60	4.68	25.58	5.84	3.97	5.81	6.55	15.12	5.33	20.93	5.43	41.86
Pre-to-core and Core-to-post	1.43	16.13	1.66	22.58	1.28	38.71	1.40	0.40	3.23	0.25	3.23	0.74	16.13	0.53	22.58
Three or more other schedules	2.86	22.22	2.14	20.00	1.38	28.89	1.87	0.79	4.44	1.26	11.11	0.89	13.33	0.98	28.89
Less than three other schedules	7.43	13.33	7.84	16.92	9.67	46.67	8.76	5.56	7.18	3.78	7.69	2.37	8.21	3.40	23.08
Total	100.00	11.52	100.00	13.86	100.00	30.98	100.00	100.00	8.30	100.00	13.07	100.00	22.26	100.00	43.63

Table 8D. Work time arrangements among employed workers, gender and age of youngest child: Norway (1990)

Age of youngest child Work time arrangements	Panel A: Male						Panel B: Female									
	Pre-school age		School age		None		Pre-school age		School age		None					
	Per cent of total	Per cent in work arrangement	Per cent of total	Per cent in work arrangement	Per cent of total	Per cent in work arrangement	Per cent of total	Per cent in work arrangement	Per cent of total	Per cent in work arrangement	Per cent of total	Per cent in work arrangement				
Core only	45.5	11.0	45.6	15.8	49.7	25.7	47.5	52.4	49.4	6.5	56.5	18.6	50.0	22.4	52.3	47.6
Core only and Pre-to-core			1.6	50.0	0.6	28.6	0.8	78.6			0.2	7.1	0.2	7.1	0.3	21.4
Pre-to-core	7.1	14.4	7.4	21.6	6.5	28.1	6.9	64.1	5.3	5.9	5.2	14.4	4.2	15.7	4.7	35.9
Core and Core-to-post	2.3	7.2	5.8	26.8	4.1	27.8	4.2	61.9	2.4	4.1	2.8	12.4	3.6	21.6	3.2	38.1
Core-to-post	21.6	11.8	18.0	14.0	20.6	24.0	20.0	49.8	20.6	6.1	21.6	16.1	27.6	27.9	24.4	50.2
Post only and Core-to-post	8.4	11.7	10.3	20.7	9.0	27.0	9.3	59.5	8.4	10.8	5.9	11.3	7.1	18.5	7.7	40.5
Core only, Core-to-post, Post only	8.4	15.3	8.1	21.2	6.9	27.1	7.6	63.5	5.3	5.3	5.4	13.5	5.2	17.6	5.3	36.5
Pre-to-core and Core-to-post	1.0	60.0	0.2	20.0	0.2	20.0	0.4	100.0	1.0	3.2	1.4	19.4	1.0	19.4	1.1	41.9
Three or more other schedules	3.2	32.3	1.1	16.1	0.5	9.7	1.3	58.1	3.2	7.0	0.9	9.3	1.0	14.0	1.1	30.2
Less than three other schedules	2.6	18.6	1.8	18.6	2.1	32.6	2.1	69.8	1.8	6.6	100.0	16.4	100.0	22.2	100.0	45.2
Total	100.0	12.0	100.0	17.2	100.0	25.7	100.0	54.8	100.0	6.6	100.0	16.4	100.0	22.2	100.0	45.2

Table 8F. Work time arrangements among employed workers, gender and age of youngest child: Netherlands (1995)

Age of youngest child Work time arrangements	Panel A: Male						Panel B: Female										
	Pre-school age		School age		None		Pre-school age		School age		None						
	Per cent of total	Per cent in work arrangement	Per cent of total	Per cent in work arrangement	Per cent of total	Per cent in work arrangement	Per cent of total	Per cent in work arrangement	Per cent of total	Per cent in work arrangement	Per cent of total	Per cent in work arrangement					
Core only	41.9	6.0	46.8	8.4	49.7	13.4	46.9	27.9	67.0	5.0	65.4	9.0	67.1	14.2	66.5	28.2	
Core only and Pre-to-core	8.4	11.8	6.2	10.9	6.0	15.7	6.7	38.4	1.4	1.0	2.6	3.4	3.3	6.7	2.7	11.1	
Pre-to-core	23.8	12.3	19.0	12.3	16.6	16.1	19.1	40.7	6.1	1.6	9.6	4.7	8.5	6.4	8.4	12.8	
Core and Core-to-post	3.2	6.7	3.5	9.2	4.9	19.3	4.0	35.2	2.6	2.9	2.0	4.0	4.1	12.6	3.1	19.5	
Core-to-post	6.1	5.5	10.0	11.4	8.1	13.8	8.2	30.7	9.4	4.4	8.7	7.6	6.6	8.8	7.8	20.8	
Post only and Core-to-post	4.6	9.0	2.7	6.6	3.7	13.5	3.6	29.1	6.4	6.6	3.9	7.3	3.5	9.9	4.1	23.8	
Core only, Core-to-post, Post only	4.6	7.7	4.8	10.0	4.9	15.4	4.8	33.1	4.5	3.9	5.3	8.5	3.6	8.9	4.3	21.3	
Pre-to-core and Core-to-post	1.7	12.9	1.5	14.3	1.1	15.6	1.4	42.9	0.2	0.7	0.3	2.0	0.7	8.2	0.5	10.9	
Three or more other schedules	1.7	9.6	1.3	9.1	2.0	21.2	1.7	39.9	0.7	2.0	0.8	4.0	1.2	10.1	1.0	16.2	
Less than three other schedules	3.9	10.2	4.2	13.8	3.0	15.0	3.6	39.0	1.7	2.4	1.5	3.8	1.4	5.2	1.5	11.4	
Total							100.0					100.0			100.0		22.7

