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Examining working time arrangements using time use survey data

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Examining Working Time Arrangements Using Time Use Survey Data

by

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Abstract

This paper uses full-record time diary data from six studies conducted in four countries, Canada (1992), the Netherlands (1990 and 1995), Norway (1980, 1990), and Sweden (1991), to analyse daily schedules of individual work time patterns. The work schedules are based on the combination of regular paid work, overtime work, second jobs, and any reported informal paid activity. We define work episodes 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. – 6:00 p.m. for Canada and Netherlands, and as 7:00 a.m. – 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. We identified 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 10 workday patterns for individuals. We found vast, though as yet statistically untested, differences in work time arrangements across countries and by sex. In general, men tended to be relatively evenly distributed over the work time arrangements defined for a typical day, while women tended to work a single episode during core hours only. 2/3 of Canadian and Swedish men worked at least some time outside core hours, while nearly half of Dutch and Norwegian men only worked during the core period. Women in Sweden worked a wider range of hours than women in the other three countries. Where possible, this paper explores relations between other aspects of working arrangements and the timing of paid work episodes. We found a strong relationship between the scheduling and the duration of paid work. People who worked both pre-core to core and core to post-core episodes worked the longest hours, while people working post-core only or only working core to post-core episodes put in the fewest hours.

Non-Technical Summary

Time diary research collects detailed accounts of the activities in which people engage over the course of a day. This paper uses time diary data from six studies conducted in four countries, Canada (1992), the Netherlands (1990 and 1995), Norway (1980 and 1990), and Sweden (1991), to find out how people schedule their paid work (including overtime, moonlighting, informal or casual work) over the course of the day. In particular, we wanted to find out how often people work outside of normal business hours, and how people working non-standard hours fit work into the rest of their day. We also wanted to find out how many work episodes people undertook in a day. We defined a work episode as a period which starts as people begin to work having done other activities for at least an hour before working and ending when people again do other activities for at least an hour following doing paid work. While most people overall worked during standard business hours, work outside these hours was frequent in all four countries. While women in Sweden worked during a wider range of times of day than women in Canada, the Netherlands and Norway, women on the whole were more likely to only work during core business hours and to have only one episode of work in a day. Men, in contrast, were more evenly distributed across various working time arrangements. Nearly half of men in the Netherlands and Norway did some work outside regular business hours, and two-thirds of men in Canada and Sweden worked at least partly outside these hours. We identified ten main patterns of scheduling work throughout the day. These patterns are related to the total hours people worked. People who started work before standard hours, worked at least some standard hours and also worked some hours after the core period spent more of their day working than other groups of employed people. People who only worked after core hours or who started work during core hours and continued working after core hours worked the fewest hours.

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 (Mata-Greenwood, 1992). 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), 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 7 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. This data provides an ideal opportunity to examine cross-temporal change since data is 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, 2:00am 4:00am. 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.

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 (as well as for the UK, which has not been included in this study). 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-population. 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 which 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 countries 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 mid-night. 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 summarises 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.

Table 1 – The Definitions of Core, Pre-core and Post-core Work Hours

Site	Pre-Core	Core Work Hours	Post-Core	Night
Canada 1992	4:00am-8:00am	8:00am-6:00pm	6:00pm-12:00pm	12:00pm-4:00am
Netherlands 1990-Wed.	4:00am-8:00am	8:00am-6:00pm	6:00pm-12:00pm	12:00pm-4:00am
Netherlands 1995-Wed.	4:00am-8:00am	8:00am-6:00pm	6:00pm-12:00pm	12:00pm-4:00am
Norway 1980	4:00am-7:00am	7:00am-4:00pm	4:00pm-12:00pm	12:00pm-4:00am
Norway 1990	4:00am-7:00am	7:00am-4:00pm	4:00pm-12:00pm	12:00pm-4:00am
Sweden 1991	4:00am-7:00am	7:00am-4:00pm	4:00pm-12:00pm	12:00pm-4:00am

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 (preendcore)
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 hyper-code reflecting all the realised 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.

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

Figure 1 - Work Episode Start Times

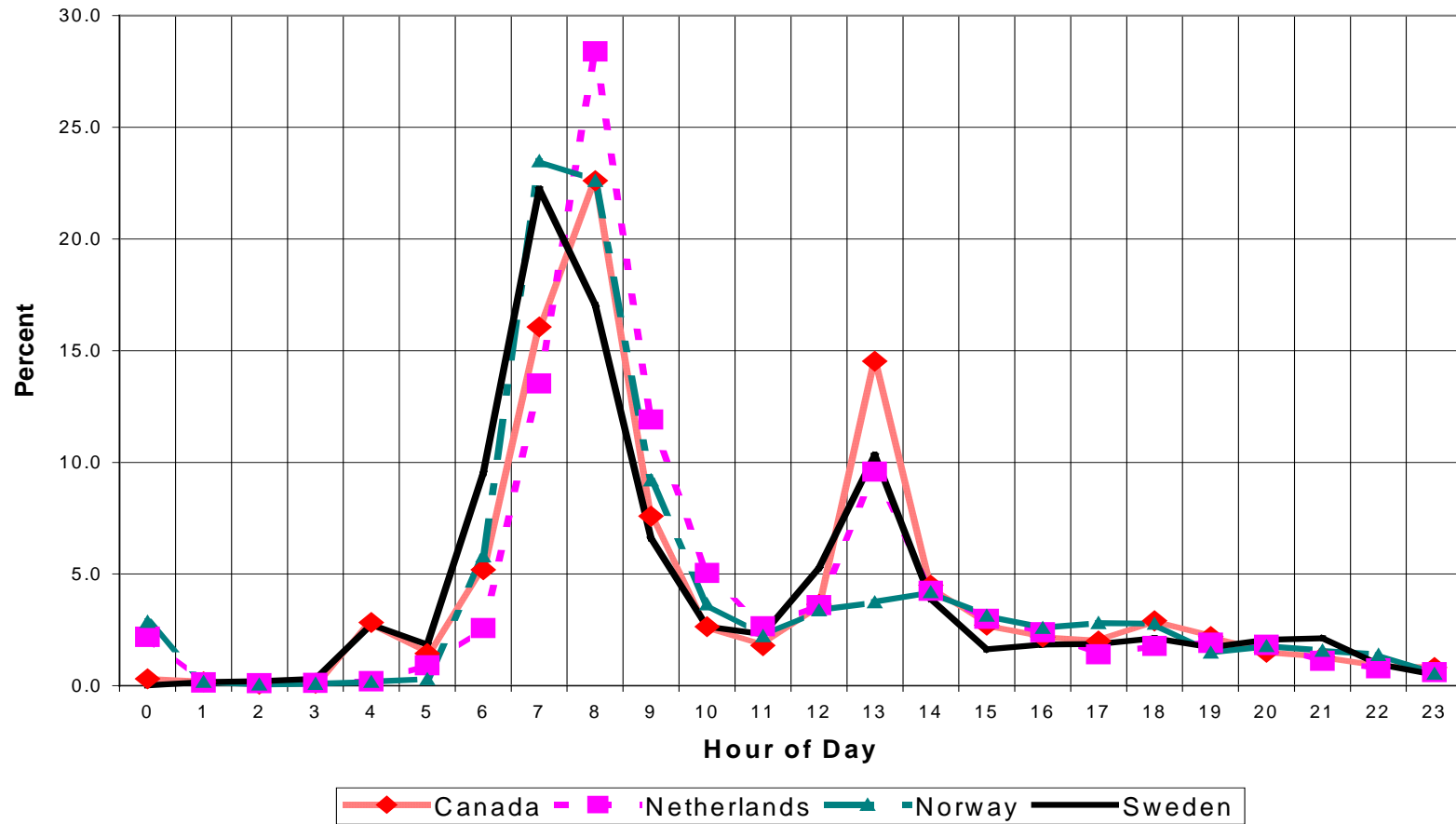


Figure 2 - End Hour of Work Activites

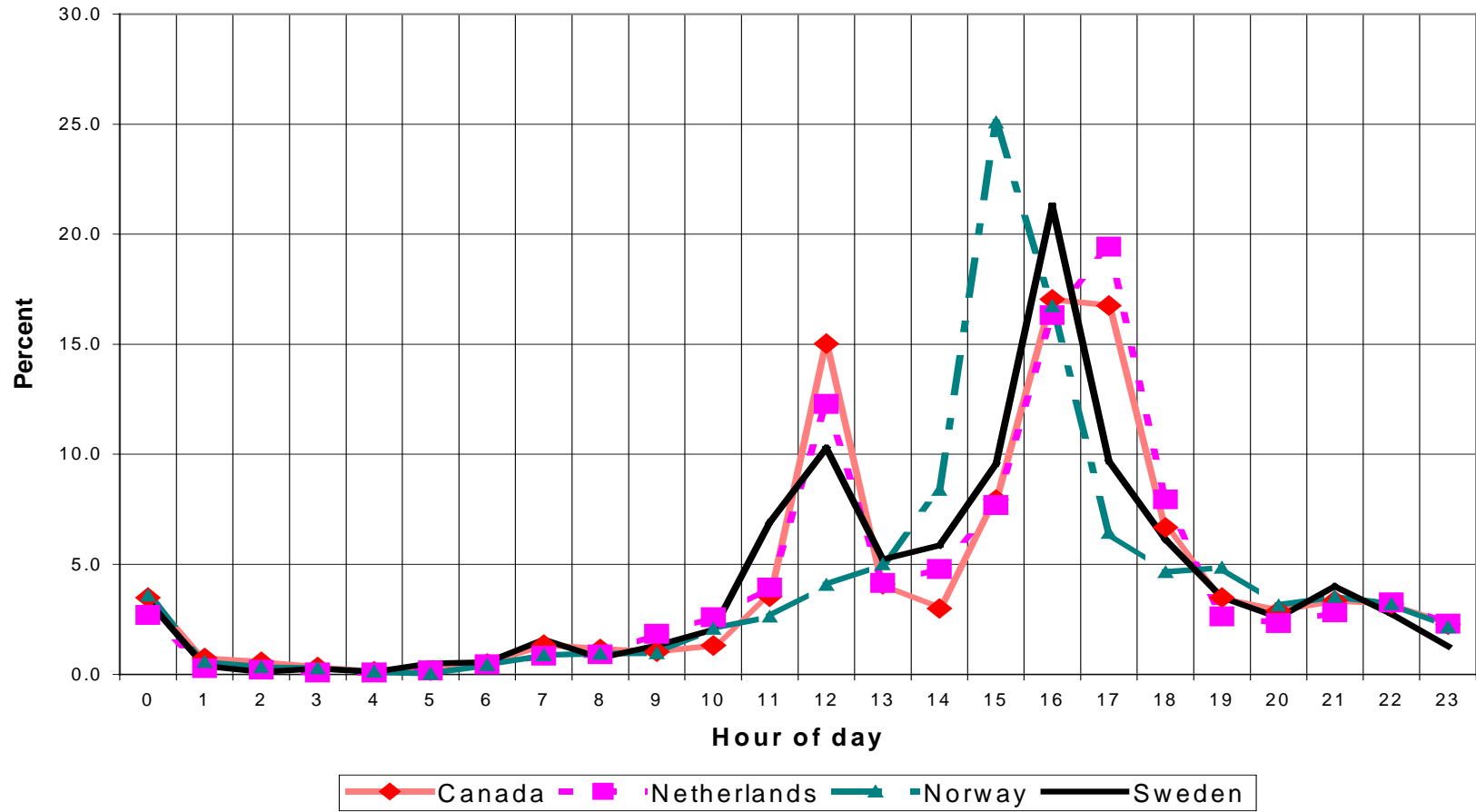


Table 2 – The Definitions of Work Time Patterns

	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
Preendcore	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 of 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 That is 101000 would be “coreonly” on a weekday and 201000 would be “coreonly’ on a weekend day.

Table 3: Distribution of the Daily Work Arrangements in the Different Surveys

	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%	3365	52%	4297	55%	1110	51%	1361	51%	1515	42%
Core Only & Pre To Core	38	2%	399	6%	391	5%	12	1%	24	1%	697	20%
Pre To Core	275	11%	994	15%	1142	14%	140	6%	204	7%	249	7%
Core & Core To Post	367	15%	236	4%	286	4%	72	3%	122	5%	276	8%
Core To Post	580	24%	588	9%	626	8%	462	21%	477	18%	217	6%
Post Only & Core To Post	88	4%	266	4%	298	4%	184	8%	173	6%	121	3%
Core Only, Core To Post, Post Only	120	5%	301	5%	360	5%	151	7%	223	8%	110	3%
Pre To Core & Core To Post	25	1%	68	1%	79	1%	5	0%	8	0%	74	2%
Three Or More Other Schedules	38	1%	87	1%	111	1%	29	1%	42	2%	100	3%
Less Than Three Other Periods	140	6%	208	3%	212	3%	37	2%	45	2%	202	6%
Totals	2435	100%	6512	100%	7802	100%	2202	100%	2679	100%	3561	100%

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 minimising 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.

Table 4 - Canada 1992, Distribution of Combination of Episodes Over the Day

Episode type	Coretype	Frequency	Percent	Cumulative Percent
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 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 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 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 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 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 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
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
All episode types (A + B + C + D + E)	11111.00	3	0.1	100.0
	Total	3561	100.0	
	Total	3561	100.0	

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 that 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 analyze 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 Netherlands and Norway data. 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 case of Netherlands to assess any difference from the average week days. However, due to smaller number of observations for Wednesday, we decided to also analyzed Netherlands' data 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 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 percent of males worked core-only hours while another 22.6 percent worked core only & pre core to core (Table 5A). The latter group would have had a pattern of work consisting of a work episode starting before 8:00am and continuing after 8:00am, and another episode separated from the first by at least 60 minutes which started and ended between 8:00am and 6:00pm .compared with 50.7 percent of females (Table 5A). Canadian females had 50.7 percent of their work episodes in the core and another 15.8 in the core only & pre to core periods, about two-thirds in all. In the Netherlands two-thirds of females 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 vs. 46.6 percent) and core to post arrangements (54.4 vs. 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 percent in Norway in 1980. In general, women seem to be over represented in core only, core to post and post only & core to post arrangements.

In European data men dominate the core-only and pre to core pattern (77.5 to 91.3%) relative to Canada (63.7%, Table 5B). This suggests a tendency of Canadian women to be earlier to work (36.3%) , relative to men, than their Dutch (8.7%) or Swedish (21.05%) counterparts. In all four countries women are less likely to have odd schedules such as those incorporated in the two 'other' categories. Men in 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 above results is presented in three sets of Tables for each country provided in the Appendix. 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. 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 percent of men and more than 60 percent 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.

Working Time Arrangements For Different Groups of Workers and Changes Over Time

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 permits this breakdown of analysis for Norway, for the years 1980 and 1990; and 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 Netherlands for the available years. The Norwegian data suggest that there was a tendency in the eighties 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 earlier time of the day towards later time of the day during the eighties. One possible reason for this shift was the introduction of extended shopping hours in Norway in mid-eighties. The work pattern changed slightly in opposite direction in Netherlands over the early nineties where the preference for work during core hours increased.¹ Apart from different conditions in the two countries, one could also generalise these results as reflections of different economic times that prevailed over the fifteen year period (1980-95) in both countries. The severe recessions of the eighties 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 nineties may have removed such limitation and resulted in choice of earlier day time work. Core time was the dominant work arrangement over the entire fifteen year period.

¹ The 1990s' introduction of extended shopping hours are not reflected in the Netherlands data which are for 1995.

Table 5A – Distribution of Work Time Arrangements in the Different Surveys, Males and Females

Work Time Arrangements	MALE						
	Canada Percent of Males	Netherlands 1995 Wednesday Percent of Males	Netherlands 1990 Whole Week Percent of Males	Netherlands 1995 Whole Week Percent of Males	Sweden Percent of Males	Norway (1990) Percent of Males	Norway (1980) Percent of Males
Core Only	36	47	43	47	28	48	49
Core Only & Pre To Core	23	5	9	7	2	1	1
Pre To Core	8	21	20	19	12	7	9
Core & Core To Post	8	2	4	4	13	4	5
Core To Post	5	8	8	8	21	20	16
Post Only & Core To Post	3	3	4	4	6	9	6
Core Only, Core To Post, Post Only	3	7	5	5	6	8	9
Pre To Core & Core To Post	3	1	1	1	1	0	1
Three Or More Other Schedules	4	3	2	2	2	1	1
Less Than Three Other Schedules	7	3	4	3	9	2	3
Total	100	100	100	100	100	100	100

Work Time Arrangements	FEMALE						
	Canada Percent of Females	Netherlands 1995 Wednesday Percent of Females	Netherlands 1990 Whole Week Percent of Females	Netherlands 1995 Whole Week Percent of Females	Sweden Percent of Females	Norway (1990) Percent of Females	Norway (1980) Percent of Females
Core Only	51	70	63	67	35	52	53
Core Only & Pre To Core	16	1	3	3	1	0	0
Pre To Core	6	9	8	8	9	5	5
Core & Core To Post	7	2	3	3	14	3	4
Core To Post	7	6	11	8	25	25	21
Post Only & Core To Post	3	4	4	4	6	8	7
Core Only, Core To Post, Post Only	3	6	4	4	5	5	7
Pre To Core & Core To Post	1	0	1	1	1	0	0
Three Or More Other Schedules	2	1	1	1	1	1	2
Less Than Three Other Schedules	4	1	2	1	3	1	1
Total	100	100	100	100	100	100	100

Table 5B – The Split Between Males and Females Among the Persons in Different Work Time Arrangements

Work Time Arrangements	PANEL A: MALES						
	<u>Canada</u>	<u>Netherlands 1995</u> <u>Wednesdays</u>	<u>Netherlands 1990</u> <u>Whole Week</u>	<u>Netherlands 1995</u> <u>Whole Week</u>	<u>Sweden</u>	<u>Norway (1990)</u>	<u>Norway (1980)</u>
	Percent in Work Arrangement	Percent in Work Arrangement	Percent in Work Arrangement	Percent in Work Arrangement	Percent in Work Arrangement	Percent in Work Arrangement	Percent in Work Arrangement
Core Only	47	48	47	50	51	53	57
Core Only & Pre To Core	64	91	82	77	80	79	83
Pre To Core	64	76	76	76	63	64	70
Core & Core To Post	57	69	66	64	54	62	67
Core To Post	46	64	49	60	52	50	51
Post Only & Core To Post	55	52	53	55	58	60	57
Core Only, Core To Post, Post Only	58	61	60	61	58	64	65
Pre To Core & Core To Post	81	80	76	80	77	100	75
Three Or More Other Schedules	71	77	74	71	71	58	45
Less Than Three Other Schedules	68	87	70	77	77	70	91
Total	55	58	56	58	56	55	59

Work Time Arrangements	PANEL B: FEMALES						
	<u>Canada</u>	<u>Netherlands 1995</u> <u>Wednesdays</u>	<u>Netherlands 1990</u> <u>Whole Week</u>	<u>Netherlands 1995</u> <u>Whole Week</u>	<u>Sweden</u>	<u>Norway (1990)</u>	<u>Norway (1980)</u>
	Percent in Work Arrangement	Percent in Work Arrangement	Percent in Work Arrangement	Percent in Work Arrangement	Percent in Work Arrangement	Percent in Work Arrangement	Percent in Work Arrangement
Core Only	53	52	53	50	49	48	44
Core Only & Pre To Core	36	9	18	23	21	21	17
Pre To Core	37	23	24	24	37	36	29
Core & Core To Post	43	31	34	36	46	38	33
Core To Post	54	37	51	40	48	50	49
Post Only & Core To Post	46	48	47	45	42	41	43
Core Only, Core To Post, Post Only	42	39	40	39	42	37	35
Pre To Core & Core To Post	19	20	24	20	23	-	25
Three Or More Other Schedules	29	23	26	29	29	42	55
Less Than Three Other Schedules	32	13	30	23	23	30	9
Total	45	42	43	42	44	45	42

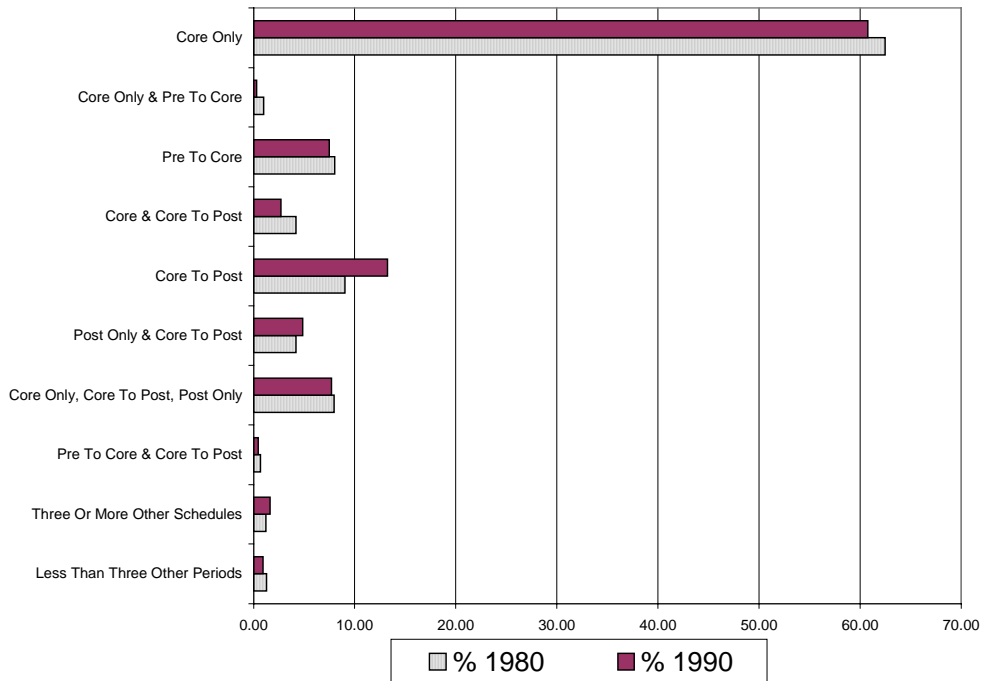


Figure 3 - Work Time Arrangements in Norway, Both Sexes, 1980 and 1990

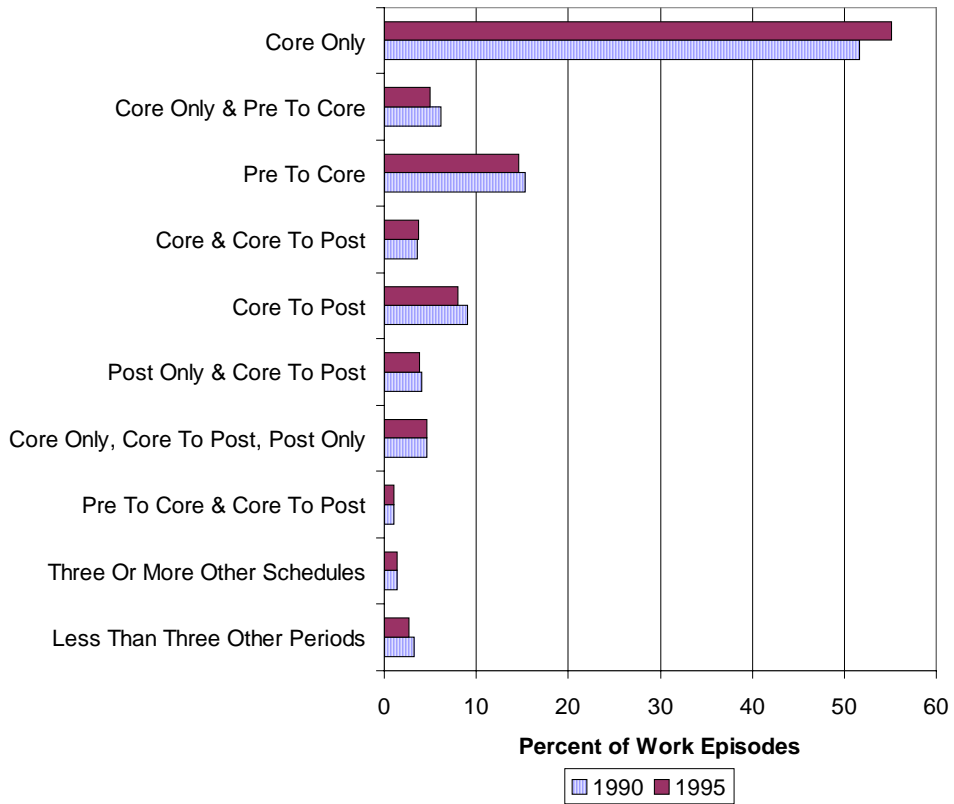


Figure 4 - Work Time Arrangements in Netherlands, Both Sexes, 1990 and 1995

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 percent 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).

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.

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 arrangement. This observation could reflect the effect of recession in the early nineties which may have resulted in job openings which were mostly part-time. Swedish full-time employees are more evenly distributed, are late starters and have 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.

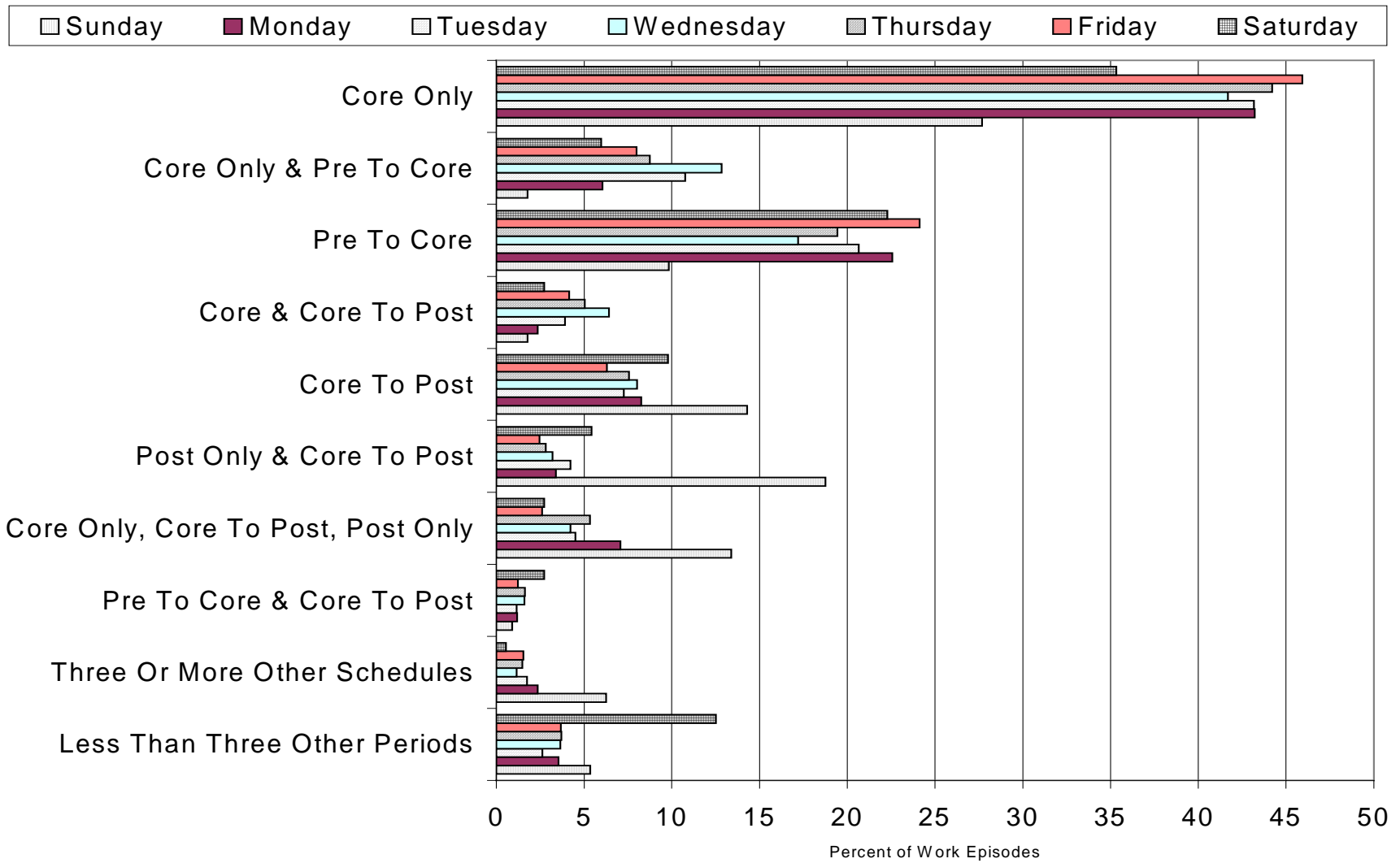


Figure 5 – Percentage of Work Episodes by Working Time Arrangements and Days of the Week, Netherlands, 1990, Males

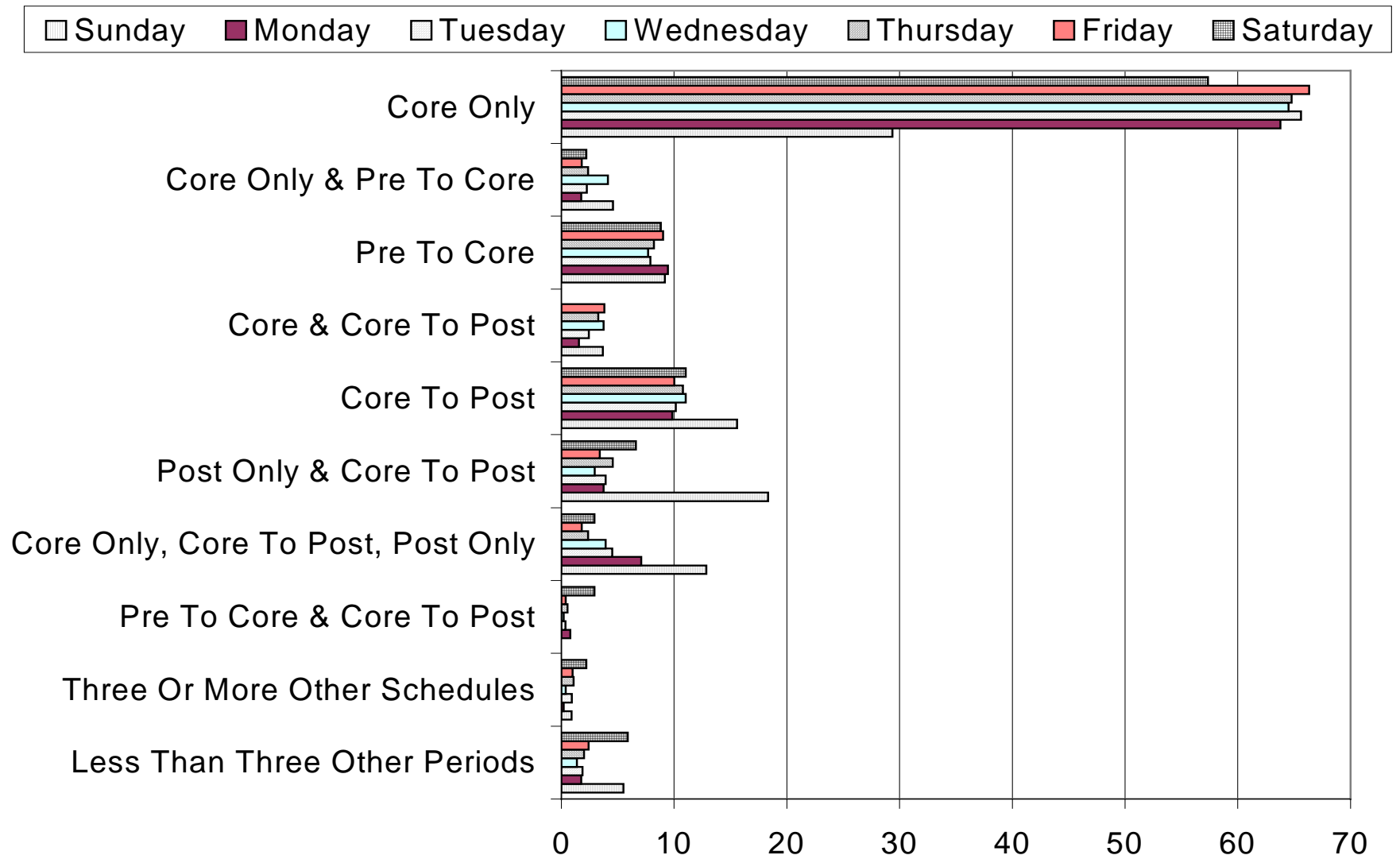


Figure 6 – Percentage of Work Episodes by Working Time Arrangements and Days of the Week, Netherlands 1990, Females

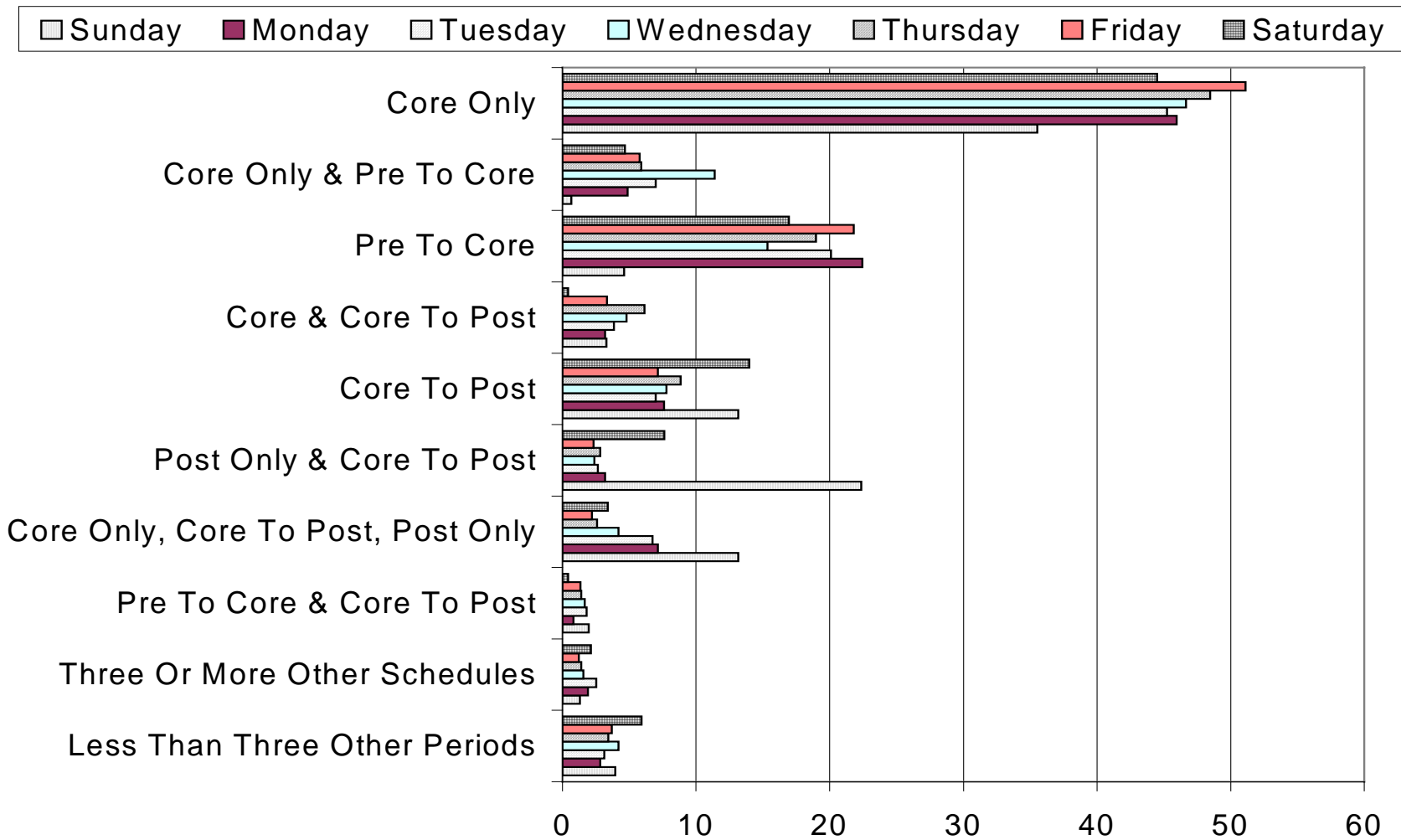


Figure 7 – Percentage of Work Episodes by Working Time Arrangements and Days of the Week, Netherlands 1995 Males

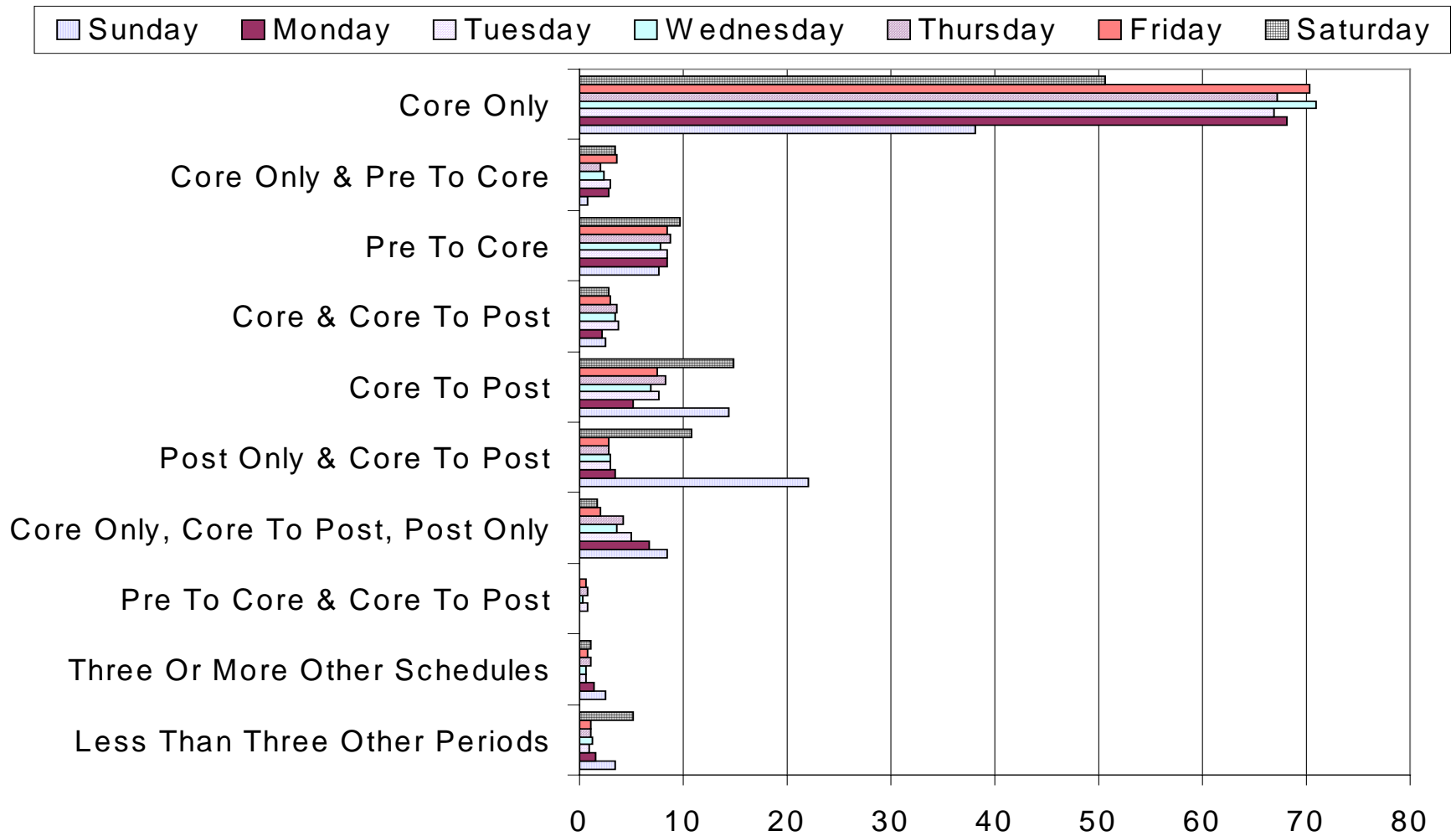


Figure 8 – Percentage of Work Episodes by Working Time Arrangements and Days of the Week, Netherlands, Females 1995

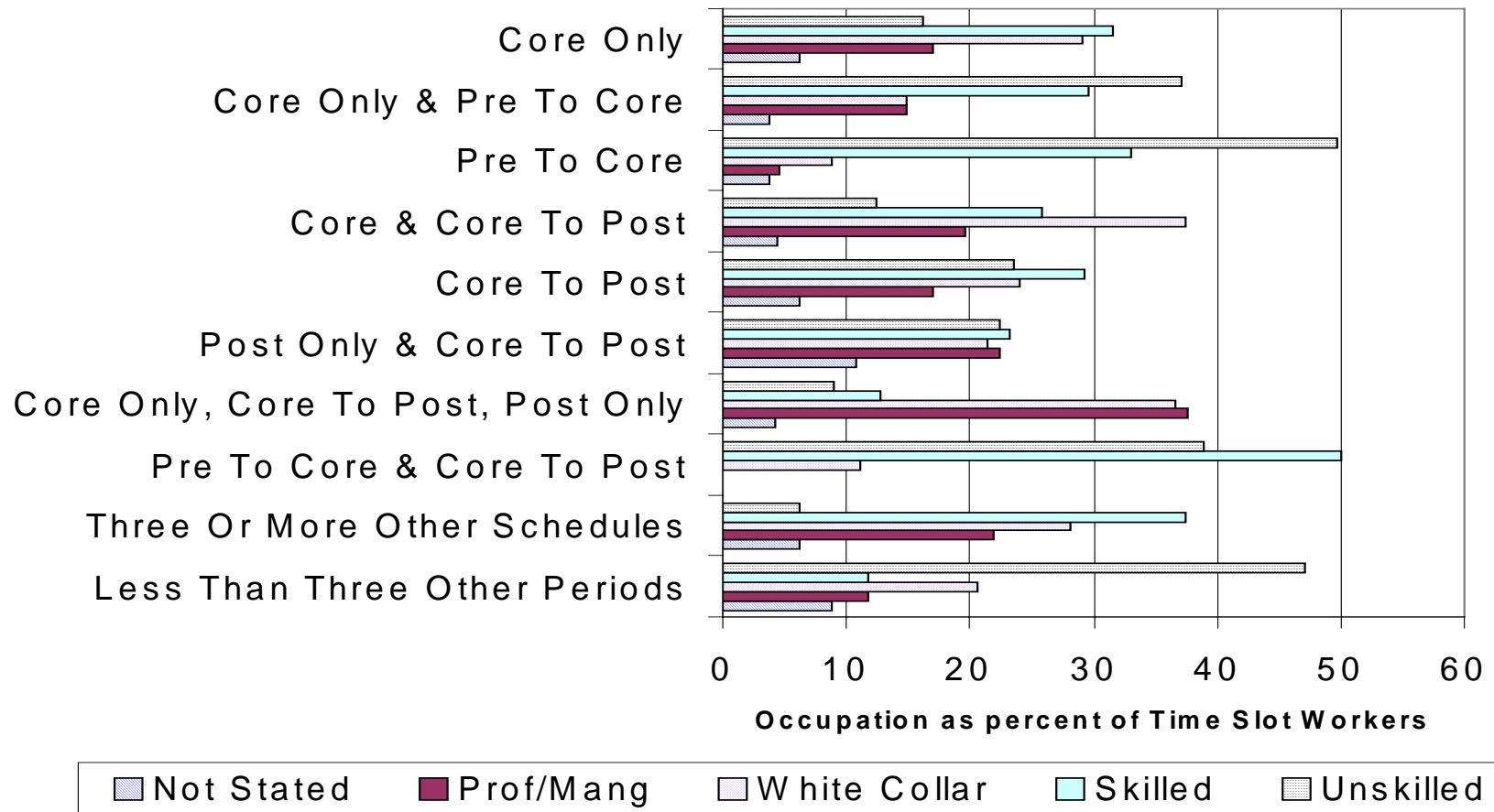


Figure 9 – Work Episodes by Working Time Arrangement and Occupation in Norway, 1980

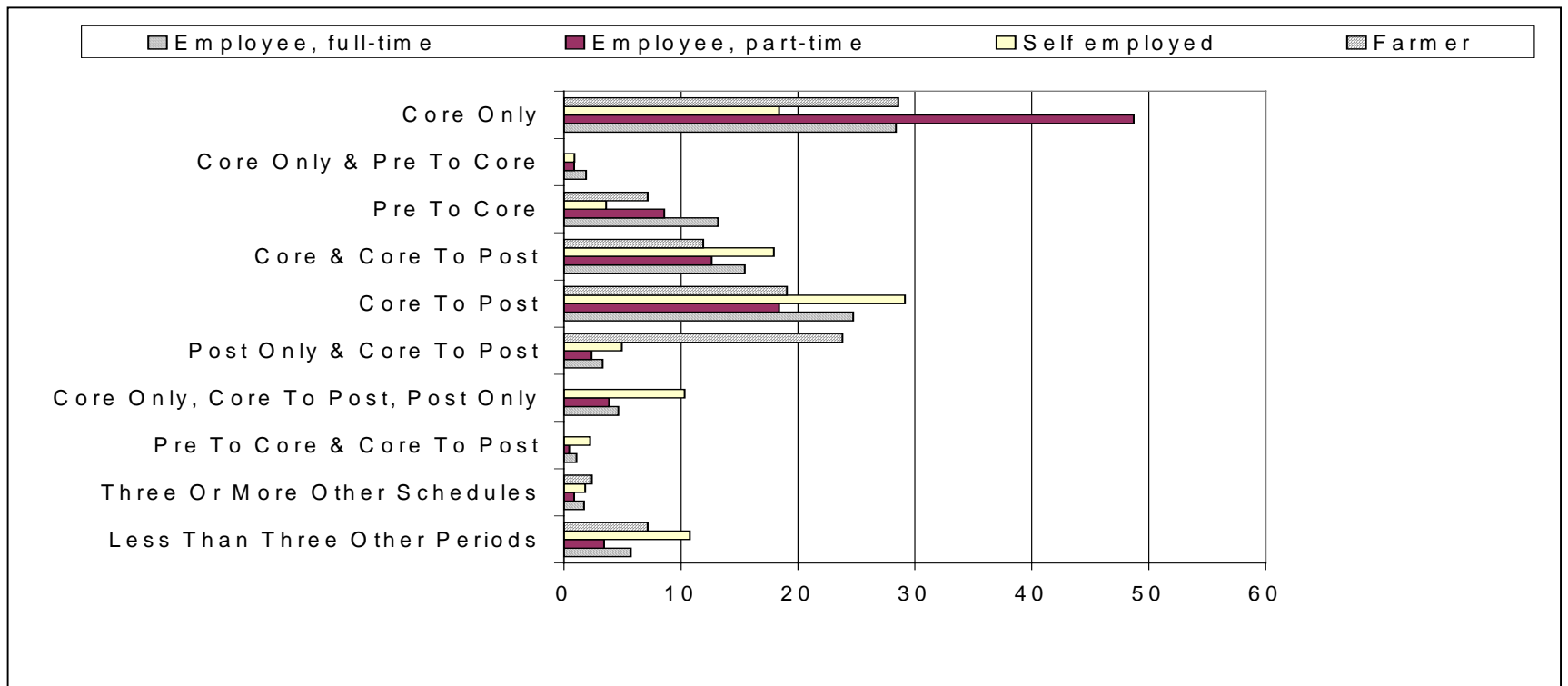


Figure 10 - Work Episodes by Working Time Arrangement and Type of Job Tenure in Sweden, 1991

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 the Table, 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. Self-employed Canadians are heavily concentrated in Core Only hours but are more evenly distributed over the work time arrangement than Swedish.

Table 9 – Work Episodes by Type of Job Tenure and Working Time Arrangements, Canada 1992, Sweden 1991

Job Tenure	Canada 1992			Sweden 1991			
	Employee	Self Employed	Other	Full-Time	Part-Time	Self Employed	Farmer
Core Only	43.3	40.4	46.7	28.4	48.7	18.4	28.6
Core Only & 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 & 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 & 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 & 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	100	100	100	100	100	100

Table 10 – Percentage of People by Working Time Arrangement, Union Membership, and Presence of On Call Work Contracts

Work Time Arrangements	Canada 1992				
	Union Member		On Call Worker		TOTAL
	Yes	No	Yes	No	
Core Only	38.5	44.5	36.0	45.0	42.5
Core Only & 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 & 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 & 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 & 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

Canadian data also provide labour market information on union membership status and type of worker; whether “on-call” or not. These information have been summarised in Table 10. Around 38.5 percent of union members in Canada work during core hours only and 25.3 percent 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 workers “On Call.” As expected, these workers tend to be more evenly distributed over the work time arrangements than those not on call. However, their concentration in “Core Only” hours is worth noting.

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 week, types of work shifts (day, evening, night, split and rotating) and flexible schedules. Workers who work a compressed work week are less likely to work core hours only those who do not. However, in both categories (worked compressed week and not), there is greater concentration towards “Core Only” hours.

More day time 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 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 percent 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.

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 6:00pm they cannot work more than 6 hours in that day. On the other hand, if ones starts working before core hours, say at 7:00am, they 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.

Table 11 – Percentage of People With Different Work Patterns by Working Time Arrangement, Canada 1992

	Compressed Week		Work Pattern					Flexible Schedule	
	Yes	No	Regular Shift			Split Shift	Rotating Shift	Yes	No
			Day	Evening	Night				
Core Only	36.2	43.4	49.1	14.2	6	30.6	24.7	44.4	41.8
Core Only & Pre To Core	21.9	19.5	23.2	2.7	1.5	11.3	15.1	15.5	22.2
Pre To Core	9.4	6.7	7.3	2	16.4	8.1	5.5	7.3	6.8
Core & Core To Post	9.1	7.6	6.4	8.1	1.5	14.5	12.2	10.7	5.9
Core To Post	5.8	6	3.2	39.9	7.5	14.5	9.6	5.8	6
Post Only & Core To Post	3.6	3.3	1.5	15.5	10.4	3.2	6.8	3	3.5
Core, Core To Post, and Post	2.4	3	2.3	7.4		1.6	4.9	3.3	2.8
Pre To Core & Core To Post	1.2	2.2	2			1.6	1.3	2.7	1.7
Three Or More Other Schedules	3	2.8	2.6		1.5	6.5	4.2	3.1	2.7
Less Than Three Other Periods	7.3	5.4	2.5	10.1	55.2	8.1	15.8	4	6.6
Total	100	100	100	100	100	100.0	100	100	100

Table 12 – People by Working Time Arrangement Over Weekdays and Weekends: Males and Females in Canada, 1992

	Male		Female	
	Col %	Count	Col %	Count
Weekday Core Only	31.6	621	46.1	736
Weekday Core Only & Pre To Core	21.0	413	14.7	234
Weekday Pre To Core	7.0	138	4.9	79
Weekday Core & Core To Post	6.9	136	6.4	103
Weekday Core To Post	4.0	79	6.1	98
Weekday Post Only & 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 & 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 & Pre To Core	1.6	31	1.2	19
Weekend Pre To Core	1.0	20	0.8	12
Weekend Core & Core To Post	1.1	22	0.9	15
Weekend Core To Post	1.0	20	1.3	20
Weekend Post Only & 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 & 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

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.

Work hours can also be calculated from reported diaries. If weeklong 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.

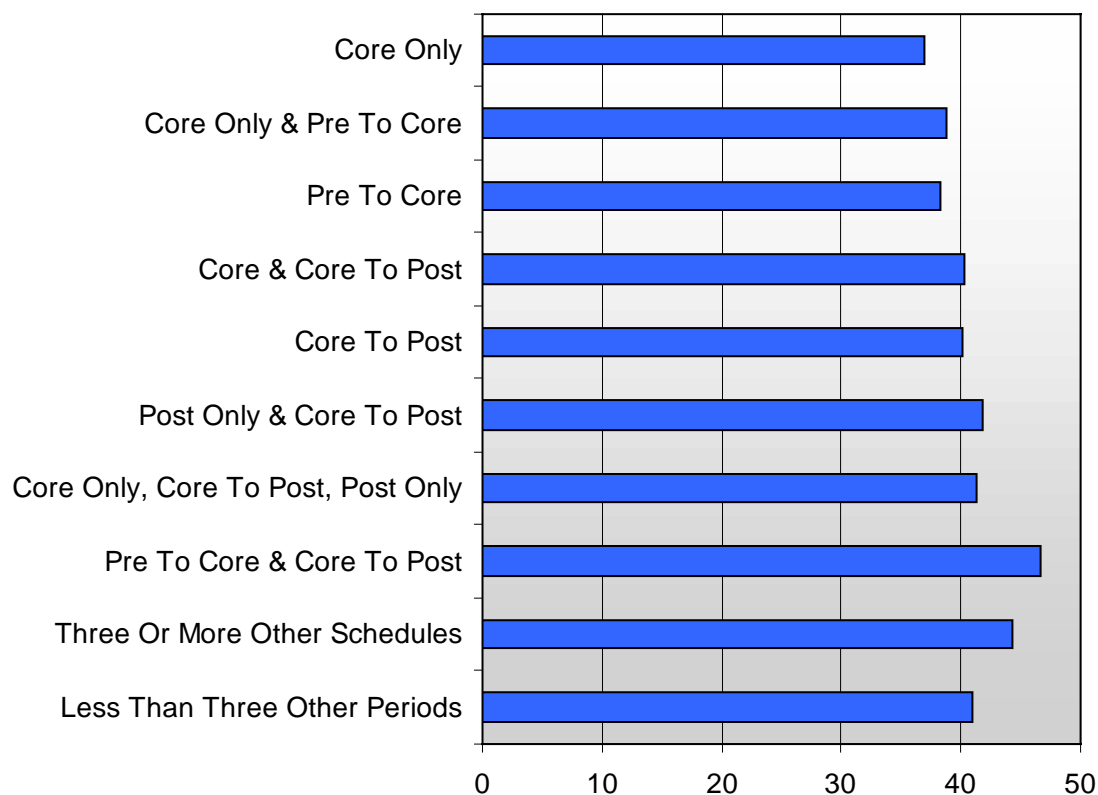
There is considerable variation in the average weekly hours attendant with the various work arrangements, regardless of the particular measure of work hours, Figure 12. Significance testing (see Figures 15 and 16) suggested that worker estimates of work hours (33 of 45) comparisons of work hours by arrangement) 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 male estimated hours. 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 work week. For women the estimate was about 62 hours and 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.

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, 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 11 – Stated Hours by Working Time Arrangement, Males in Sweden, 1991



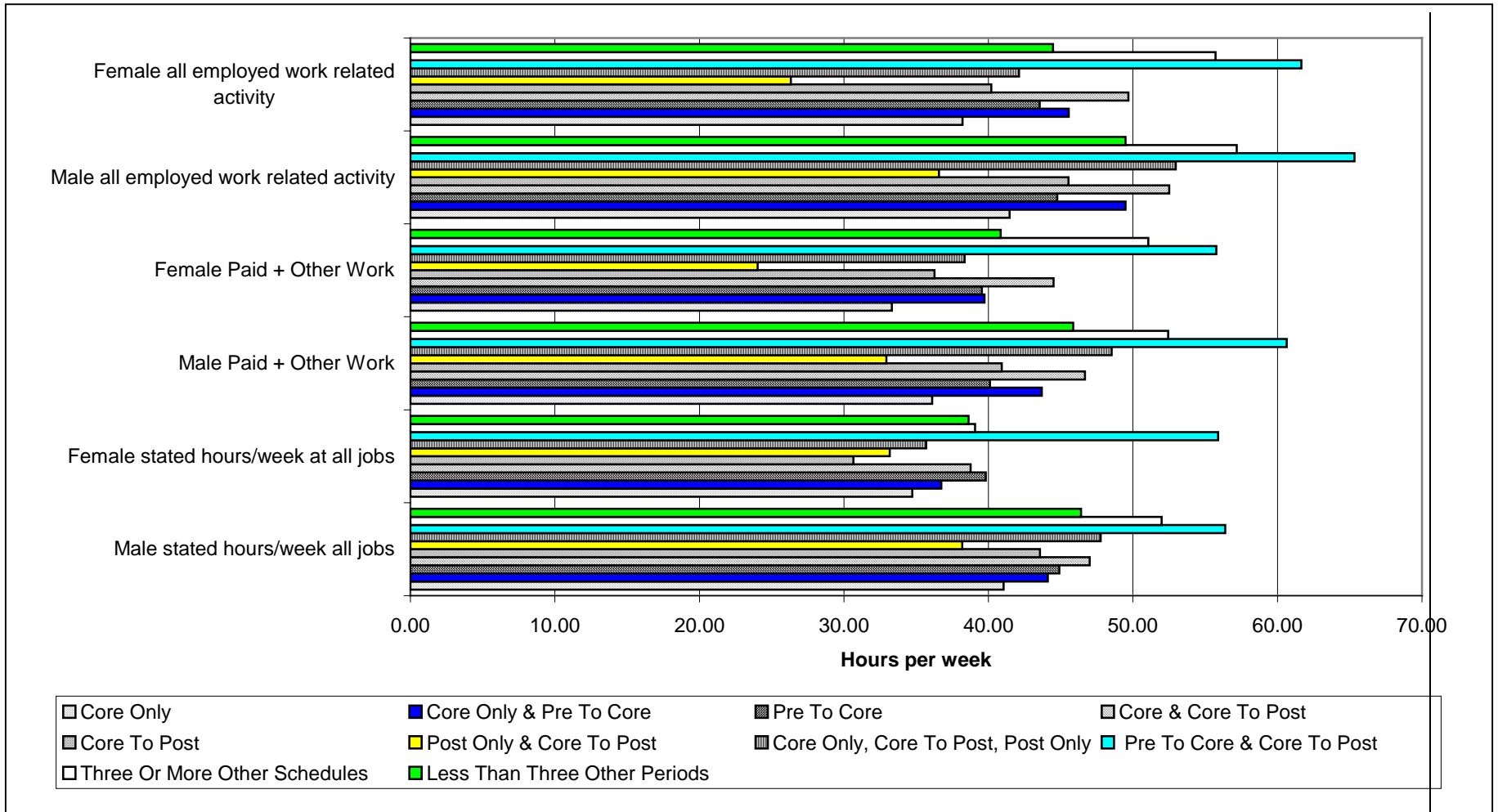


Figure 12 - Average Hours of Work According to Stated and Diary Job Hours by Working Time Arrangement for Males and Females, Canada 1992

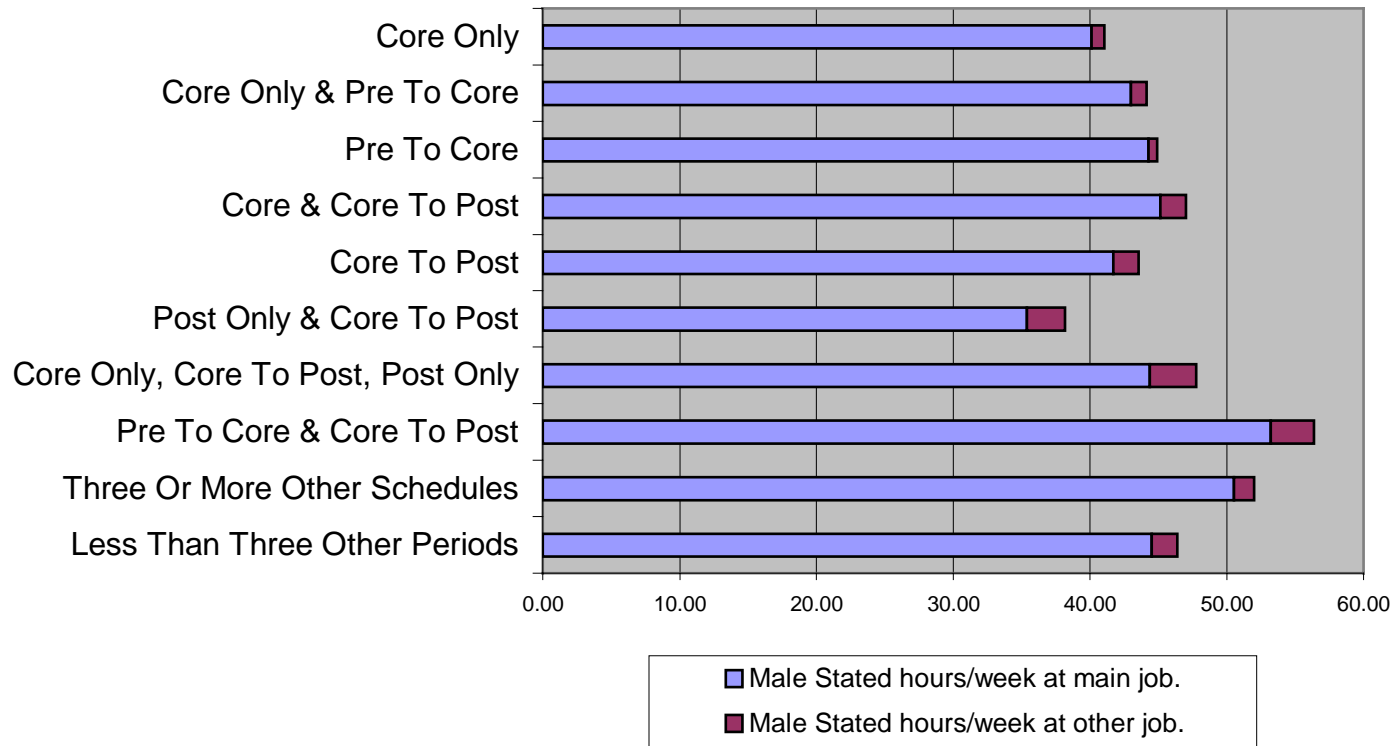


Figure 13 - Average Stated Main and Other Job Hours by Working Time Arrangement, Males, Canada 1992

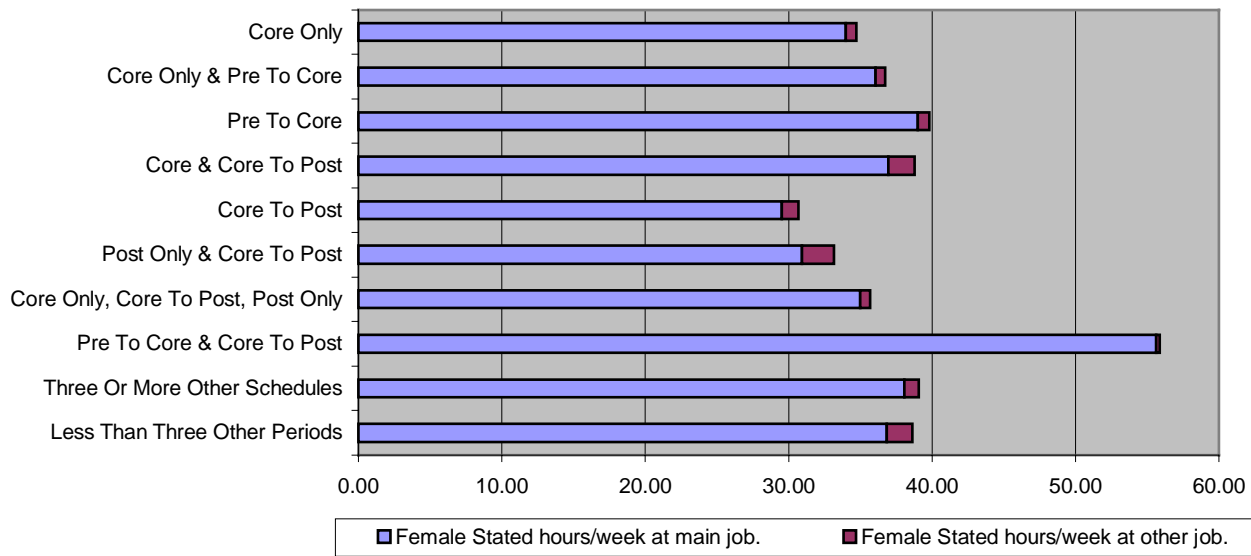


Figure 14 - Average Stated Main and Other Job Hours by Working Time Arrangement, Females, Canada 1992

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 which exists in present time use data. Second, we will comment on the factors which 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 Exists in Present Time Use Data

The clear majority of time diary studies conducted in industrialised 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.

	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 & Pre to Core	X									
Pre to Core	X									
Core & Core to Post	X									
Core to Post										
Post Only and Core to Post										
Core Only, Core to Post, Post Only										
Pre to Core & 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 15: Multiple Comparisons of Average Weekly Hour Estimates of Respondents

	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 & Pre to Core	X									
Pre to Core	X									
Core & 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 & 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.

Figure 16: Multiple Comparisons of Average Paid Weekly Hours (derived from the Diary)

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 UK 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 (Gershuny 2000). 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 work 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 half an hour 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 10 hour shift or a half hour 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 which 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 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. To begin with, patterns of work over the lifetime changed over the course of the Twentieth century. At the beginning of the last century, many people worked the majority of their adult lives (Ausubel and Grübler 1995). By the century's end, most people in industrialised countries stayed in school for an increasing period of their youth, and retired from their main working life well before the end of their lives (Ausubel and Grübler 1995). The transitions between student and working adult and between working adult and retirement are often marked by mini-jobs which people work for a few hours, often at non-standard times. People working in some fields of employment traditionally have not worked during the general standard working hours. These fields cover "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 industrialised countries has lead to increased demand on out of hours medical assistance. Generally greater affluence and changing trends away from eating meals at home has lead to increased demand for restaurant, take-a-way 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 lead 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 lead businesses to cut costs by reducing the lengths of contracts, cutting overtime payments, and seeking greater flexibility in hours of work

from employees (Purcell et. al. 1999). At the same time, unions concerned for the health and well-being of employees working long 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) (Purcell et. al. 1999).

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 (Purcell et. al. 1999). In consequence, working mothers who choose to be with their children for as long as possible seek out "mum's shifts" (Purcell et. al. 1999), which allow them to work only while the children are at school. 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 others work (Purcell et. al. 1999). In consequence, jobs with early starting times or late ending times appeal to a growing sector of the employment market. Nevertheless, 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 (Purcell et. al. 1999).

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 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 standardised 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 peoples 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 harmonised 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 methods 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?”.

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Appendix A: Details of The 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 am) 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 am : 30 minutes	Fixed: 15 minutes Between midnight and 6:00 am : 30 minutes	Fixed: 10 minutes Between midnight and 5:00 am : 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 1990 & 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 Activities -166
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;7variables---contact(With Whom or in the Presence of Whom the Activity Takes Place-4variety)->with any combination of 1=Alone, 2=Family, 3=Friends, 4=Others, 9=Missing
Location Coding	0=At home 1=At home (around) 2=Work pl. 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
Over-sample		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 #'s to obtain 10,000)
Sampling size	5049 persons	5 000 persons	4881 persons (gross) 3 638 persons (net) + oversample	1990=3415 1995=3227	12,675 households (gross) 8,996 (net)

Appendix B – Tables

Table 6A – Male and Female Workers by Age Groups by Working Time Arrangements, Canada, 1992

PANEL A: MALE by Age Groups										
Work Time Arrangements	<u>15-24</u>		<u>25-44</u>		<u>45-64</u>		<u>65 and up</u>		Group Total	
	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent of Males	Percent 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
Core Only & Pre To Core	14.8	5.5	23.9	42.0	25.3	15.9	4.8	0.3	22.6	63.7
Pre To Core	8.6	8.8	7.3	35.7	9.3	16.5	14.3	2.4	8.0	63.5
Core & Core To Post	9.4	8.7	7.8	34.8	8.0	12.7	7.1	1.1	8.0	57.2
Core To Post	9.4	11.1	5.1	28.6	2.7	5.5	2.4	0.5	5.0	45.6
Post Only & Core To Post	4.3	9.1	3.4	34.7	2.5	9.1	4.8	1.7	3.4	54.5
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
Pre To Core & Core To Post	1.6	5.4	3.3	54.1	3.4	20.3	2.4	1.4	3.1	81.1
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
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
Total	100.0	7.2	100.0	34.5	100.0	12.3	100.0	1.2	100.0	55.2

PANEL B: FEMALE by Age Groups										
Work Time Arrangements	<u>15-24</u>		<u>25-44</u>		<u>45-64</u>		<u>65 and up</u>		Group Total	
	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent of Females	Percent in Work Arrangement
Core Only	44.6	7.7	55.1	35.6	43.1	9.8	37.5	0.4	50.7	53.4
Core Only & Pre To Core	14.6	5.5	13.9	19.5	22.7	11.2	6.3	0.1	15.8	36.3
Pre To Core	3.8	4.0	4.6	18.1	9.9	13.7	12.5	0.8	5.7	36.5
Core & Core To Post	10.4	9.8	6.0	21.4	8.5	10.5	18.8	1.1	7.4	42.8
Core To Post	12.3	14.7	7.2	32.3	3.8	6.0	18.8	1.4	7.4	54.4
Post Only & Core To Post	3.8	8.3	3.3	26.4	3.8	10.7	0.0	0.0	3.4	45.5
Core Only, Core To Post, Post Only	0.8	1.8	3.4	30.0	3.2	10.0	0.0	0.0	2.9	41.8
Pre To Core & Core To Post	0.4	1.4	1.1	14.9	0.6	2.7	0.0	0.0	0.9	18.9
Three Or More Other Schedules	1.5	4.0	1.9	19.0	1.7	6.0	0.0	0.0	1.8	29.0
Less Than Three Other Schedules	7.7	9.9	3.5	16.8	2.6	4.5	6.3	0.5	4.0	31.7
Total	100.0	7.3	100.0	27.5	100.0	9.6	100.0	0.4	100.0	44.8

Table 6B - Work Time Arrangements Among Employed Workers, Gender and Age Groups, Netherlands, 1995

PANEL A: MALE by Age Group

Work Time Arrangements	<u>15-24</u>		<u>25-44</u>		<u>45-64</u>		<u>65 and up</u>		Group Total	
	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent of Males	Percent in Work Arrangement
Core Only	50.8	3.8	45.5	32.2	48.5	11.7	66.7	0.5	46.7	48.2
Core Only & Pre To Core	3.3	4.4	5.1	63.0	5.7	23.9	0.0	0.0	5.0	91.3
Pre To Core	19.7	5.1	24.0	58.3	15.5	12.8	0.0	0.0	21.5	76.2
Core & Core To Post	3.3	6.9	2.6	51.7	1.6	10.3	0.0	0.0	2.4	69.0
Core To Post	11.5	7.1	7.3	42.4	7.2	14.1	0.0	0.0	7.6	63.6
Post Only & Core To Post	3.3	4.6	2.1	27.3	4.1	18.2	16.7	2.3	2.8	52.3
Core Only, Core To Post, Post Only	0.0	0.0	6.8	40.6	10.3	20.8	0.0	0.0	7.1	61.5
Pre To Core & Core To Post	3.3	20.0	0.9	50.0	0.5	10.0	0.0	0.0	1.0	80.0
Three Or More Other Schedules	1.6	3.2	2.8	51.6	3.1	19.4	16.6	3.2	2.9	77.4
Less Than Three Other Schedules	3.3	6.7	3.0	56.7	3.6	23.3	0.0	0.0	3.1	86.7
Total	100.0	4.3	100.0	40.1	100.0	13.6	100.0	0.4	100.0	58.4

PANEL B: FEMALE by Age Groups

Work Time Arrangements	<u>15-24</u>		<u>25-44</u>		<u>45-64</u>		<u>65 and up</u>		Group Total	
	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent of Females	Percent in Work Arrangement
Core Only	70.8	6.3	70.9	35.3	69.5	10.2	0.0	0.0	70.4	51.8
Core Only & Pre To Core	1.4	2.2	0.5	4.4	0.9	2.2	0.0	0.0	0.7	8.7
Pre To Core	13.9	4.3	10.0	17.0	5.1	2.6	0.0	0.0	9.4	23.8
Core & Core To Post	1.4	3.5	1.7	24.1	0.9	3.5	0.0	0.0	1.5	31.0
Core To Post	9.7	7.1	5.5	22.2	5.9	7.1	0.0	0.0	6.1	36.4
Post Only & Core To Post	1.4	2.3	3.5	31.8	4.2	11.4	50.0	2.3	3.5	47.7
Core Only, Core To Post, Post Only	0.0	0.0	5.5	22.9	12.7	15.6	0.0	0.0	6.2	38.5
Pre To Core & Core To Post	0.0	0.0	0.5	20.0	0.0	0.0	0.0	0.0	0.3	20.0
Three Or More Other Schedules	0.0	0.0	1.5	19.4	0.9	3.2	0.0	0.0	1.2	22.6
Less Than Three Other Schedules	1.4	3.3	0.5	6.7	0.0	0.0	50.0	3.3	0.7	13.3
Total	100.0	5.1	100.0	28.2	100.0	8.3	100.0	0.2	100.0	41.6

Table 6C - Work Time Arrangements Among Employed Workers, Gender and Age Groups, Sweden, 1991

Work Time Arrangements	PANEL A: MALE by Age Groups								Group Total	
	<u>15-24</u>		<u>25-44</u>		<u>45-64</u>		<u>65 and up</u>		Percent of Males	Percent in Work Arrangement
	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement		
Core Only	29.0	4.7	26.0	23.1	29.5	22.7	100.0	0.2	27.8	50.6
Core Only & Pre To Core	2.6	10.5	1.7	36.8	1.7	31.6	0.0	0.0	1.8	79.0
Pre To Core	21.1	9.4	12.0	29.5	11.4	24.2	0.0	0.0	12.5	63.1
Core & Core To Post	11.2	4.2	12.3	25.4	14.0	24.9	0.0	0.0	12.9	54.4
Core To Post	17.8	3.9	24.4	29.2	18.6	19.2	0.0	0.0	21.3	52.3
Post Only & Core To Post	5.9	5.2	5.1	24.9	6.7	27.8	0.0	0.0	5.8	57.8
Core Only, Core To Post, Post Only	3.3	2.9	5.4	26.2	6.9	29.1	0.0	0.0	5.8	58.1
Pre To Core & Core To Post	1.3	6.5	1.3	35.5	1.5	35.5	0.0	0.0	1.4	77.4
Three Or More Other Schedules	2.6	8.9	1.6	28.9	2.1	33.3	0.0	0.0	1.9	71.1
Less Than Three Other Schedules	5.3	4.1	10.3	44.1	7.8	28.7	0.0	0.0	8.8	76.9
Total	100.0	5.0	100.0	27.5	100.0	23.8	100.0	0.1	100.0	56.4

Work Time Arrangements	PANEL B: FEMALE by Age Groups								Group Total	
	<u>15-24</u>		<u>25-44</u>		<u>45-64</u>		<u>65 and up</u>		Percent of Females	Percent in Work Arrangement
	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement		
Core Only	27.3	3.2	34.1	25.0	37.8	20.9	37.5	0.3	35.0	49.4
Core Only & Pre To Core	0.0	0.0	0.7	13.2	0.6	7.9	0.0	0.0	0.6	21.1
Pre To Core	8.2	2.7	10.2	20.7	8.7	13.3	12.5	0.3	9.4	36.9
Core & Core To Post	13.6	3.7	13.4	22.7	14.9	19.0	12.5	0.3	14.0	45.6
Core To Post	30.0	4.7	25.5	25.2	23.6	17.5	25.0	0.3	25.1	47.7
Post Only & Core To Post	6.4	4.1	5.4	21.4	5.6	16.8	0.0	0.0	5.5	42.2
Core Only, Core To Post, Post Only	5.5	3.5	4.5	18.0	6.8	20.4	0.0	0.0	5.4	41.9
Pre To Core & Core To Post	0.9	3.2	0.9	19.4	0.0	0.0	0.0	0.0	0.5	22.6
Three Or More Other Schedules	1.8	4.4	1.0	15.6	0.8	8.9	0.0	0.0	1.0	28.9
Less Than Three Other Schedules	6.4	3.6	4.4	15.4	1.4	3.6	12.5	0.5	3.4	23.1
Total	100.0	3.6	100.0	22.7	100.0	17.1	100.0	0.3	100.0	43.6

Table 6D - Work Time Arrangements Among Employed Workers, Gender and Age Groups, Norway, 1990

PANEL A: MALE by Age Groups

Work Time Arrangements	<u>15-24</u>		<u>25-44</u>		<u>45-64</u>		<u>65 +</u>		Group Total	
	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement
Core Only	79.3	1.8	47.0	15.6	45.3	25.4	51.0	9.6	47.5	52.4
Core Only & Pre To Core			2.1	64.3	0.1	7.1	0.4	7.1	0.8	78.6
Pre To Core			7.5	20.9	6.6	31.4	7.5	11.8	6.9	64.1
Core & Core To Post	10.3	3.1	4.0	17.5	4.0	29.9	4.6	11.3	4.2	61.9
Core To Post	6.9	0.4	18.7	14.0	21.2	26.8	20.3	8.6	20.0	49.8
Post Only & Core To Post			9.3	18.0	9.3	30.2	10.4	11.3	9.3	59.5
Core Only, Core To Post, Post Only			8.4	21.2	8.6	36.5	4.1	5.9	7.6	63.5
Pre To Core & Core To Post			0.2	20.0	0.6	80.0			0.4	100.0
Three Or More Other Schedules			1.2	16.1	1.7	38.7	0.4	3.2	1.3	58.1
Less Than Three Other Periods	3.4	2.3	1.6	16.3	2.6	44.2	1.2	7.0	2.1	69.8
Group Total	100.0	1.1	100.0	16.5	100.0	27.9	100.0	9.3	100.0	54.8

PANEL B: FEMALE by Age Groups

Work Time Arrangements	<u>15-24</u>		<u>25-44</u>		<u>45-64</u>		<u>65 +</u>		Group Total	
	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement
Core Only	56.0	1.1	56.2	13.7	53.7	24.9	43.0	7.8	52.3	47.6
Core Only & Pre To Core			0.6	14.3	0.2	7.1			0.3	21.4
Pre To Core	4.0	0.7	6.4	13.1	3.4	13.1	6.0	9.2	4.7	35.9
Core & Core To Post	4.0	1.0	3.5	11.3	2.9	17.5	3.4	8.2	3.2	38.1
Core To Post	12.0	0.5	20.1	11.1	24.0	25.1	32.8	13.5	24.4	50.2
Post Only & Core To Post	8.0	0.9	4.8	6.8	8.4	22.5	9.4	9.9	7.7	40.5
Core Only, Core To Post, Post Only	8.0	1.2	6.1	11.2	5.7	20.0	3.0	4.1	5.3	36.5
Pre To Core & Core To Post										
Three Or More Other Schedules			2.2	22.6	0.5	9.7	1.3	9.7	1.1	41.9
Less Than Three Other Periods	8.0	4.7			1.3	18.6	1.3	7.0	1.1	30.2
Group Total	100.0	1.0	100.0	12.1	100.0	23.0	100.0	9.1	100.0	45.2

Table 6E - Work Time Arrangements Among Employed Workers, Gender and Age Groups, Norway, 1980

PANEL A: MALE by Age Groups

Work Time Arrangements	<u>15-24</u>		<u>25-44</u>		<u>45-64</u>		<u>65 and up</u>		Group Total	
	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement
Core Only	45.8	7.3	48.0	27.2	52.1	20.9	44.4	1.2	49.0	56.5
Core Only & Pre To Core	1.4	12.5	0.9	29.2	1.7	37.5	2.8	4.2	1.3	83.3
Pre To Core	13.0	13.7	7.3	27.5	10.8	28.9	2.8	0.5	9.2	70.6
Core & Core To Post	4.2	7.4	5.2	32.8	4.4	19.7	25.0	7.4	5.2	67.2
Core To Post	16.7	7.5	17.1	27.7	13.4	15.3	11.1	0.8	15.6	51.4
Post Only & Core To Post	7.4	9.2	7.8	34.7	3.9	12.1	2.8	0.6	6.3	56.6
Core Only, Core To Post, Post Only	6.9	6.7	10.1	35.0	8.8	21.5	8.3	1.3	9.2	64.6
Pre To Core & Core To Post			0.4	37.5	0.6	37.5			0.4	75.0
Three Or More Other Schedules	0.5	2.4	1.0	19.0	1.7	21.4	2.8	2.4	1.2	45.2
Less Than Three Other Periods	4.2	20.0	2.2	37.8	2.8	33.3			2.6	91.1

PANEL B: FEMALE by Age Groups

Work Time Arrangements	<u>15-24</u>		<u>25-44</u>		<u>45-64</u>		<u>65 and up</u>		Group Total	
	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement	Percent in Age Group	Percent in Work Arrangement
Core Only	54.3	7.9	50.6	18.8	56.8	16.5	33.3	0.3	53.3	43.5
Core Only & Pre To Core	0.5	4.2	0.4	8.3	0.3	4.2			0.4	16.7
Pre To Core	5.6	5.4	3.8	9.3	7.6	14.7			5.4	29.4
Core & Core To Post	4.1	6.6	3.4	13.9	3.3	10.7	16.7	1.6	3.6	32.8
Core To Post	23.4	9.6	20.8	22.0	18.9	15.7	50.0	1.3	20.9	48.6
Post Only & Core To Post	4.6	5.2	9.1	26.6	5.1	11.6			6.7	43.3
Core Only, Core To Post, Post Only	6.1	5.4	9.5	21.5	4.8	8.5			7.1	35.4
Pre To Core & Core To Post			0.2	12.5	0.3	12.5			0.2	25
Three Or More Other Schedules	0.5	2.4	2.2	26.2	2.8	26.2			2.1	54.8
Less Than Three Other Periods	1.0	4.4	0.2	2.2	0.3	2.2			0.4	8.9

Table 7A - Work Time Arrangements Among Employed Workers, Gender and Marital Status, Canada, 1992

PANEL A: MALE by Marital Status

Work Time Arrangements	<u>Not Married</u>		<u>Married</u>		Group Total	
	Percent of Not Married	Percent in Work Arrangement	Percent of Married	Percent in Work Arrangement	Percent of All Males	Percent in Work Arrangement
Core Only	34.1	28.3	39.3	18.4	36.0	46.6
Core Only & Pre To Core	24.5	44.1	19.2	19.5	22.6	63.7
Pre To Core	8.2	41.4	7.8	22.1	8.1	63.5
Core & Core To Post	8.2	37.3	7.8	19.9	8.1	57.3
Core To Post	4.2	24.0	6.6	21.7	5.1	45.6
Post Only & Core To Post	3.1	32.2	3.8	22.3	3.4	54.6
Core Only, Core To Post, Post Only	3.4	38.2	3.1	20.0	3.3	58.2
Pre To Core & Core To Post	3.3	55.4	2.7	25.7	3.1	81.1
Three Or More Other Schedules	3.8	48.0	3.3	23.0	3.6	71.0
Less Than Three Other Periods	7.3	45.3	6.5	22.9	7.0	68.2
Total	100.0	35.2	100.0	19.9	100.0	55.1

PANEL B: FEMALE by Marital Status

Work Time Arrangements	<u>Not Married</u>		<u>Married</u>		Group Total	
	Percent of Not Married	Percent in Work Arrangement	Percent of Married	Percent in Work Arrangement	Percent of All Females	Percent in Work Arrangement
Core Only	52.8	33.4	47.3	20.0	50.6	53.4
Core Only & Pre To Core	15.2	21.0	16.8	15.4	15.9	36.4
Pre To Core	6.3	24.1	4.9	12.5	5.7	36.6
Core & Core To Post	6.5	22.5	8.8	20.3	7.4	42.8
Core To Post	6.7	29.5	8.5	24.9	7.4	54.4
Post Only & Core To Post	3.1	24.8	3.9	20.7	3.5	45.5
Core Only, Core To Post, Post Only	3.3	29.1	2.2	12.7	2.9	41.8
Pre To Core & Core To Post	0.5	6.8	1.4	12.2	0.9	18.9
Three Or More Other Schedules	1.5	14.0	2.4	15.0	1.8	29.0
Less Than Three Other Periods	4.1	19.4	3.9	12.4	4.0	31.8
Total	100.0	26.9	100.0	17.9	100.0	44.9

Table 7B - Work Time Arrangements Among Employed Workers, Gender and Marital Status, Netherlands, 1995

PANEL A: MALE by Marital Status

Work Time Arrangements	<u>Not Married</u>		<u>Married</u>		Group Total	
	Percent of Not Married	Percent in Work Arrangement	Percent of Married	Percent in Work Arrangement	Percent of All Males	Percent in Work Arrangement
Core Only	50.8	12.4	45.5	35.8	46.8	48.3
Core Only & Pre To Core	3.1	13.0	5.7	78.3	5.1	91.3
Pre To Core	17.3	14.5	22.9	61.7	21.6	76.2
Core & Core To Post	4.6	32.1	1.6	35.7	2.3	67.9
Core To Post	9.1	18.4	7.0	44.9	7.5	63.3
Post Only & Core To Post	2.5	11.4	2.8	40.9	2.8	52.3
Core Only, Core To Post, Post Only	6.6	13.5	7.3	47.9	7.1	61.5
Pre To Core & Core To Post	1.5	30.0	0.8	50.0	1.0	80.0
Three Or More Other Schedules	1.5	9.7	3.3	67.7	2.9	77.4
Less Than Three Other Periods	3.1	20.0	3.2	66.7	3.1	86.7
Total	100.0	13.9	100.0	44.5	100.0	58.4

PANEL B: FEMALE by Marital Status

Work Time Arrangements	<u>Not Married</u>		<u>Married</u>		Group Total	
	Percent of Not Married	Percent in Work Arrangement	Percent of Married	Percent in Work Arrangement	Percent of All Females	Percent in Work Arrangement
Core Only	68.4	14.6	71.0	37.2	70.3	51.7
Core Only & Pre To Core	1.8	6.5	0.2	2.2	0.7	8.7
Pre To Core	6.4	4.7	10.7	19.2	9.5	23.8
Core & Core To Post	0.6	3.6	1.9	28.6	1.5	32.1
Core To Post	7.0	12.2	5.7	24.5	6.1	36.7
Post Only & Core To Post	3.5	13.6	3.6	34.1	3.6	47.7
Core Only, Core To Post, Post Only	8.8	15.6	5.2	22.9	6.2	38.5
Pre To Core & Core To Post	1.2	20.0	0.0	0.0	0.3	20.0
Three Or More Other Schedules	2.3	12.9	0.7	9.7	1.2	22.6
Less Than Three Other Periods	0.0	0.0	1.0	13.3	0.7	13.3
Total	100.0	12.0	100.0	29.6	100.0	41.6

Table 7C - Work Time Arrangements Among Employed Workers, Gender and Marital Status, Sweden, 1991

Work Time Arrangements	<u>Not Married</u>		<u>Married</u>		Group Total	
	Percent of Not Married	Percent in Work Arrangement	Percent of Married	Percent in Work Arrangement	Percent of All Males	Percent in Work Arrangement
Core Only	30.1	13.2	27.1	37.5	27.8	50.6
Core Only & Pre To Core	2.7	29.0	1.5	50.0	1.8	79.0
Pre To Core	16.8	20.4	11.2	42.8	12.5	63.1
Core & Core To Post	10.2	10.3	13.8	44.1	12.9	54.4
Core To Post	18.9	11.2	22.1	41.1	21.3	52.3
Post Only & Core To Post	5.3	12.7	6.0	45.1	5.8	57.8
Core Only, Core To Post, Post Only	4.4	10.5	6.3	47.7	5.8	58.1
Pre To Core & Core To Post	1.2	16.1	1.5	61.3	1.4	77.4
Three Or More Other Schedules	1.0	8.9	2.2	62.2	1.9	71.1
Less Than Three Other Periods	9.5	20.0	8.5	56.9	8.8	76.9
Total	100.0	13.6	100.0	42.8	100.0	56.4

Work Time Arrangements	<u>Not Married</u>		<u>Married</u>		Group Total	
	Percent of Not Married	Percent in Work Arrangement	Percent of Married	Percent in Work Arrangement	Percent of All Females	Percent in Work Arrangement
Core Only	28.3	10.3	37.4	39.0	35.0	49.4
Core Only & Pre To Core	0.9	7.9	0.5	13.2	0.6	21.1
Pre To Core	9.6	9.7	9.4	27.1	9.4	36.9
Core & Core To Post	15.7	13.3	13.3	32.3	14.0	45.6
Core To Post	29.7	14.6	23.5	33.1	25.1	47.7
Post Only & Core To Post	4.4	8.7	5.9	33.5	5.5	42.2
Core Only, Core To Post, Post Only	5.2	10.5	5.5	31.4	5.4	41.9
Pre To Core & Core To Post	0.9	9.7	0.4	12.9	0.5	22.6
Three Or More Other Schedules	1.5	11.1	0.8	17.8	1.0	28.9
Less Than Three Other Periods	3.8	6.7	3.3	16.4	3.4	23.1
Total	100.0	11.3	100.0	32.3	100.0	43.6

Table 7D - Work Time Arrangements Among Employed Workers, Gender and Marital Status, Norway, 1990

PANEL A: MALE by Marital Status

Work Time Arrangements	<u>Not Married</u>		<u>Married</u>		Group Total	
	Percent of Not Married	Percent in Work Arrangement	Percent of Married	Percent in Work Arrangement	Percent of All Males	Percent in Work Arrangement
Core Only	49.1	20.5	46.6	32.0	47.5	52.5
Core Only & 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 & 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 & 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 & 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 Periods	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

PANEL B: FEMALE by Marital Status

Work Time Arrangements	<u>Not Married</u>		<u>Married</u>		Group Total	
	Percent of Not Married	Percent in Work Arrangement	Percent of Married	Percent in Work Arrangement	Percent of All Females	Percent in Work Arrangement
Core Only	49.1	18.4	54.4	29.2	52.2	47.5
Core Only & 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 & 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 & 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 & Core To Post						
Three Or More Other Schedules	0.6	9.7	1.5	32.3	1.1	41.9
Less Than Three Other Periods	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

PANEL A: MALE by Marital Status

Work Time Arrangements	<u>Not Married</u>		<u>Married</u>		Group Total		
	Percent of Not Married	Percent in Work Arrangement	Percent of Not Married	Percent in Work Arrangement	Percent of All Males	Percent in Work Arrangement	
Core Only		39.8	10.1	38.4	20.4	38.8	30.6
Core Only & Pre To Core							
Pre To Core		1.0	27.3	0.6	36.4	0.7	63.6
Core & Core To Post		2.5	9.9	1.7	13.6	2.0	23.5
Core To Post		5.1	18.8	3.5	27.1	4.0	45.9
Post Only & Core To Post		38.5	12.8	40.0	27.8	39.5	40.6
Core Only, Core To Post, Post Only		11.1	3.1	14.3	8.4	13.4	11.6
Pre To Core & Core To Post							
Three Or More Other Schedules		1.6	13.2	0.5	7.9	0.8	21.1
Less Than Three Other Periods		0.3	4.8	1.1	33.3	0.8	38.1
Total		100.0	8.9	100.0	18.6	100.0	27.5

PANEL B: FEMALE by Marital Status

Work Time Arrangements	<u>Not Married</u>		<u>Married</u>		Group Total		
	Percent of Not Married	Percent in Work Arrangement	Percent of Not Married	Percent in Work Arrangement	Percent of All Females	Percent in Work Arrangement	
Core Only		37.1	20.2	32.0	49.2	33.3	69.4
Core Only & Pre To Core				0.2	100.0	0.1	100.0
Pre To Core		0.3	18.2	0.1	18.2	0.2	36.4
Core & Core To Post		1.9	16.0	2.6	60.5	2.4	76.5
Core To Post		2.2	17.6	1.6	36.5	1.8	54.1
Post Only & Core To Post		28.6	20.3	19.5	39.00	21.8	59.4
Core Only, Core To Post, Post Only		28.4	17.0	42.2	71.4	38.6	88.4
Pre To Core & Core To Post				0.1	100.0	0.0	100.0
Three Or More Other Schedules		0.4	7.9	1.4	71.1	1.2	78.9
Less Than Three Other Periods		1.0	33.3	0.3	28.6	0.5	61.9
Total		100.0	19.0	100.0	53.6	100.0	72.5

Table 7F - Work Time Arrangements Among Employed Workers, Gender and Marital Status, Netherlands, 1990

PANEL A: MALE by Marital Status

Work Time Arrangements	<u>Not Married</u>		<u>Married</u>		Group Total	
	Percent of Not Married	Percent in Work Arrangement	Percent of Not Married	Percent in Work Arrangement	Percent of All Males	Percent in Work Arrangement
Core Only	44.4	4.7	42.2	15.8	42.7	20.5
Core Only & 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 & 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 & 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 & 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 Periods	4.1	7.9	3.9	26.7	3.9	34.5
Total					100.0	25.7

PANEL B: FEMALE by Marital Status

Work Time Arrangements	<u>Not Married</u>		<u>Married</u>		Group Total	
	Percent of Not Married	Percent in Work Arrangement	Percent of Not Married	Percent in Work Arrangement	Percent of All Females	Percent in Work Arrangement
Core Only	67.2	7.2	61.7	16.3	63.3	23.4
Core Only & 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 & 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 & 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 & 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 Periods	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

PANEL A: MALE by Marital Status

Work Time Arrangements	<u>Not Married</u>		<u>Married</u>		Group Total		
	Percent of Not Married	Percent in Work Arrangement	Percent of Not Married	Percent in Work Arrangement	Percent of All Males	Percent in Work Arrangement	
Core Only		48.9	7.2	46.3	20.7	46.9	27.9
Core Only & 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 & 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 & 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 & 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 Periods		3.8	10.3	3.5	28.6	3.6	39.0
Total						100.0	31.8

PANEL B: FEMALE by Marital Status

Work Time Arrangements	<u>Not Married</u>		<u>Married</u>		Group Total		
	Percent of Not Married	Percent in Work Arrangement	Percent of Not Married	Percent in Work Arrangement	Percent of All Females	Percent in Work Arrangement	
Core Only		65.0	8.1	67.1	20.0	66.5	28.2
Core Only & 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 & 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 & 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 & 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 Periods		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

PANEL A: MALE by Age of Youngest Child

Work Time Arrangements	<u>Pre-School Age</u>		<u>School Age</u>		<u>None</u>		Group Total	
	Percent of Total	Percent in Work Arrangement	Percent of Total	Percent in Work Arrangement	Percent of Total	Percent in Work Arrangement	Percent of Males	Percent in Work Arrangement
Core Only	36.6	10.2	33.7	7.3	36.3	29.1	36.0	46.6
Core Only & Pre To Core	25.5	15.5	23.0	10.8	21.5	37.5	22.6	63.7
Pre To Core	9.4	16.1	7.4	9.6	7.7	37.8	8.0	63.5
Core & Core To Post	5.4	8.3	9.5	11.2	8.6	37.7	8.0	57.3
Core To Post	4.5	8.8	4.3	6.5	5.4	30.4	5.0	45.6
Post Only & Core To Post	3.5	12.4	2.5	6.6	3.5	35.5	3.4	54.6
Core Only, Core To Post, Post Only	2.8	10.9	3.1	9.1	3.5	38.2	3.3	58.2
Pre To Core & Core To Post	3.3	18.9	3.1	13.5	3.0	48.7	3.1	81.1
Three Or More Other Schedules	3.3	14.0	5.2	17.0	3.3	40.0	3.6	71.0
Less Than Three Other Periods	5.7	11.9	8.3	13.4	7.2	43.1	7.0	68.3
Total	100.0	11.9	100.0	9.2	100.0	34.1	100.0	55.2

PANEL B: FEMALE by Age of Youngest Child

Work Time Arrangements	<u>Pre-School Age</u>		<u>School Age</u>		<u>None</u>		Group Total	
	Percent of Total	Percent in Work Arrangement	Percent of Total	Percent in Work Arrangement	Percent of Total	Percent in Work Arrangement	Percent of Females	Percent in Work Arrangement
Core Only	57.7	11.7	57.0	12.9	46.1	28.8	50.7	53.4
Core Only & Pre To Core	12.4	5.5	12.2	6.0	18.3	24.8	15.8	36.3
Pre To Core	5.2	6.4	3.8	5.2	6.6	24.9	5.7	36.6
Core & Core To Post	5.5	6.2	7.9	9.8	7.8	26.8	7.4	42.8
Core To Post	4.9	6.9	6.4	10.1	8.6	37.3	7.4	54.4
Post Only & Core To Post	4.2	10.7	4.4	12.4	2.9	22.3	3.4	45.5
Core Only, Core To Post, Post Only	2.3	6.4	4.1	12.7	2.6	22.7	2.9	41.8
Pre To Core & Core To Post	0.3	1.4	1.2	5.4	1.0	12.2	0.9	18.9
Three Or More Other Schedules	1.3	4.0	0.9	3.0	2.3	22.0	1.8	29.0
Less Than Three Other Periods	6.2	9.4	2.3	4.0	3.9	18.3	4.0	31.7
Total	100.0	8.6	100.0	9.7	100.0	26.6	100.0	44.9

Table 8B - Work Time Arrangements Among Employed Workers, Gender and Age of Youngest Child, Netherlands, 1995

PANEL A: MALE by Age of Youngest Child

Work Time Arrangements	<u>Pre-School Age</u>		<u>School Age</u>		<u>None</u>		Group Total	
	Percent of Total	Percent in Work Arrangement	Percent of Total	Percent in Work Arrangement	Percent of Total	Percent in Work Arrangement	Percent of Males	Percent in Work Arrangement
Core Only	40.6	10.2	46.2	14.3	50.3	23.8	46.7	48.2
Core Only & Pre To Core	4.5	19.6	5.6	30.4	5.0	41.3	5.0	91.3
Pre To Core	29.2	25.1	22.0	23.0	17.3	28.1	21.5	76.2
Core & Core To Post	1.5	10.3	2.0	17.2	3.1	41.4	2.4	69.0
Core To Post	4.5	9.1	10.0	25.3	7.6	29.3	7.6	63.6
Post Only & Core To Post	3.5	15.9	2.8	15.9	2.3	20.5	2.8	52.3
Core Only, Core To Post, Post Only	8.9	18.8	5.2	13.5	7.3	29.2	7.1	61.5
Pre To Core & Core To Post	1.0	20.0	0.8	20.0	1.1	40.0	1.0	80.0
Three Or More Other Schedules	3.5	22.6	1.6	12.9	3.4	42.0	2.9	77.4
Less Than Three Other Periods	3.0	20.0	4.0	33.3	2.6	33.3	3.1	86.7
Total	100.0	14.2	100.0	17.5	100.0	26.8	100.0	58.4

PANEL B: FEMALE by Age of Youngest Child

Work Time Arrangements	<u>Pre-School Age</u>		<u>School Age</u>		<u>None</u>		Group Total	
	Percent of Total	Percent in Work Arrangement	Percent of Total	Percent in Work Arrangement	Percent of Total	Percent in Work Arrangement	Percent of Females	Percent in Work Arrangement
Core Only	70.8	9.3	71.0	16.1	69.8	26.4	70.4	51.8
Core Only & Pre To Core	0.5	2.2	1.0	6.5	0.7	8.7
Pre To Core	7.6	3.4	10.4	8.1	9.5	12.3	9.4	23.8
Core & Core To Post	1.9	6.9	0.6	3.5	2.0	20.7	1.5	31.0
Core To Post	6.6	7.1	7.7	14.1	4.9	15.2	6.1	36.4
Post Only & Core To Post	5.7	13.6	2.2	9.1	3.6	25.0	3.5	47.7
Core Only, Core To Post, Post Only	5.7	6.3	4.9	9.4	7.2	22.9	6.2	38.5
Pre To Core & Core To Post	0.6	10.0	0.3	10.0	0.3	20.0
Three Or More Other Schedules	0.9	3.2	1.6	9.7	1.0	9.7	1.2	22.6
Less Than Three Other Periods	0.9	3.3	0.5	3.3	0.7	6.7	0.7	13.3
Total	100.0	7.4	100.0	12.8	100.0	21.4	100.0	41.6

Table 8C - Work Time Arrangements Among Employed Workers, Gender and Age of Youngest Child, Sweden, 1991

PANEL A: MALE by Age of Youngest Child

Work Time Arrangements	<u>Pre-School Age</u>		<u>School Age</u>		<u>None</u>		Group Total	
	Percent of Total	Percent in Work Arrangement	Percent of Total	Percent in Work Arrangement	Percent of Total	Percent in Work Arrangement	Percent of Males	Percent in Work Arrangement
Core Only	21.7	8.1	28.3	12.7	29.9	29.9	27.8	50.6
Core Only & Pre To Core	1.1	10.5	1.0	10.5	2.3	57.9	1.8	79.0
Pre To Core	15.7	16.2	7.6	9.4	13.5	37.5	12.5	63.1
Core & Core To Post	12.0	10.3	14.0	14.5	12.8	29.6	12.9	54.4
Core To Post	26.6	13.3	22.3	13.5	18.9	25.5	21.3	52.3
Post Only & Core To Post	4.3	8.7	7.6	18.5	5.6	30.6	5.8	57.8
Core Only, Core To Post, Post Only	6.9	14.0	7.6	18.6	4.7	25.6	5.8	58.1
Pre To Core & Core To Post	1.4	16.1	1.7	22.6	1.3	38.7	1.4	77.4
Three Or More Other Schedules	2.9	22.2	2.1	20.0	1.4	28.9	1.9	71.1
Less Than Three Other Periods	7.4	13.3	7.8	16.9	9.7	46.7	8.8	76.9
Total	100.0	11.5	100.0	13.9	100.0	31.0	100.0	56.4

PANEL B: FEMALE by Age of Youngest Child

Work Time Arrangements	<u>Pre-School Age</u>		<u>School Age</u>		<u>None</u>		Group Total	
	Percent of Total	Percent in Work Arrangement	Percent of Total	Percent in Work Arrangement	Percent of Total	Percent in Work Arrangement	Percent of Females	Percent in Work Arrangement
Core Only	39.3	10.5	33.3	14.0	34.5	24.8	35.0	49.4
Core Only & Pre To Core	0.4	2.6	0.8	7.9	0.6	10.5	0.6	21.1
Pre To Core	10.3	7.7	10.1	11.8	8.7	17.4	9.4	36.9
Core & Core To Post	10.3	6.4	12.6	12.3	16.1	26.9	14.0	45.6
Core To Post	22.6	8.2	24.9	14.2	26.2	25.4	25.1	47.7
Post Only & Core To Post	6.4	9.3	6.6	15.0	4.6	17.9	5.5	42.2
Core Only, Core To Post, Post Only	4.0	5.8	6.6	15.1	5.3	20.9	5.4	41.9
Pre To Core & Core To Post	0.4	3.2	0.3	3.2	0.7	16.1	0.5	22.6
Three Or More Other Schedules	0.8	4.4	1.3	11.1	0.9	13.3	1.0	28.9
Less Than Three Other Periods	5.6	7.2	3.8	7.7	2.4	8.2	3.4	23.1
Total	100.0	8.3	100.0	13.1	100.0	22.3	100.0	43.6

Table 8D - Work Time Arrangement Among Employed Workers, Gender and Age of Youngest Child, Norway, 1990

PANEL A: MALE by Age of Youngest Child

Work Time Arrangements	<u>Pre-School Age</u>		<u>School Age</u>		<u>None</u>		Group Total	
	Percent of Total	Percent in Work	Percent of Total	Percent in Work	Percent of Total	Percent in Work	Percent of	Percent in Work
		Arrangement		Arrangement		Arrangement	Males	Arrangement
Core Only	45.5	11.0	45.6	15.8	49.7	25.7	47.5	52.4
Core Only & Pre To Core			1.6	50.0	0.6	28.6	0.8	78.6
Pre To Core	7.1	14.4	7.4	21.6	6.5	28.1	6.9	64.1
Core & Core To Post	2.3	7.2	5.8	26.8	4.1	27.8	4.2	61.9
Core To Post	21.6	11.8	18.0	14.0	20.6	24.0	20.0	49.8
Post Only & Core To Post	8.4	11.7	10.3	20.7	9.0	27.0	9.3	59.5
Core Only, Core To Post, Post Only	8.4	15.3	8.1	21.2	6.9	27.1	7.6	63.5
Pre To Core & Core To Post	1.0	60.0	0.2	20.0	0.2	20.0	0.4	100.0
Three Or More Other Schedules	3.2	32.3	1.1	16.1	0.5	9.7	1.3	58.1
Less Than Three Other Periods	2.6	18.6	1.8	18.6	2.1	32.6	2.1	69.8
Total	100.0	12.0	100.0	17.2	100.0	25.7	100.0	54.8

PANEL B: FEMALES by Age of Youngest Child

Work Time Arrangements	<u>Pre-School Age</u>		<u>School Age</u>		<u>None</u>		Group Total	
	Percent of Total	Percent in Work	Percent of Total	Percent in Work	Percent of Total	Percent in Work	Percent of	Percent in Work
		Arrangement		Arrangement		Arrangement	Females	Arrangement
Core Only	49.4	6.5	56.5	18.6	50.0	22.4	52.3	47.6
Core Only & Pre To Core	0.6	7.1	0.2	7.1	0.2	7.1	0.3	21.4
Pre To Core	5.3	5.9	5.2	14.4	4.2	15.7	4.7	35.9
Core & Core To Post	2.4	4.1	2.8	12.4	3.6	21.6	3.2	38.1
Core To Post	20.6	6.1	21.6	16.1	27.6	27.9	24.4	50.2
Post Only & Core To Post	14.1	10.8	5.9	11.3	7.1	18.5	7.7	40.5
Core Only, Core To Post, Post Only	5.3	5.3	5.4	13.5	5.2	17.6	5.3	36.5
Pre To Core & Core To Post								
Three Or More Other Schedules	0.6	3.2	1.4	19.4	1.0	19.4	1.1	41.9
Less Than Three Other Periods	1.8	7.0	0.9	9.3	1.0	14.0	1.1	30.2
Total	100.0	6.6	100.0	16.4	100.0	22.2	100.0	45.2

Table 8E - Work Time Arrangements Among Employed Workers, Gender and Age of Youngest Child, Netherlands, 1990

PANEL A: MALE by Age of Youngest Child

Work Arrangements	<u>Pre-School Age</u>		<u>School Age</u>		<u>None</u>		Group Total	
	Percent of Total	Percent in Work Arrangement	Percent of Total	Percent in Work Arrangement	Percent of Total	Percent in Work Arrangement	Percent of Males	Percent in Work Arrangement
Core Only	39.4	3.3	36.0	5.7	48.4	11.5	42.7	20.5
Core Only & Pre To Core	10.0	8.1	11.8	18.2	6.6	15.1	8.9	41.4
Pre To Core	20.6	6.2	25.0	14.2	17.5	14.8	20.5	35.3
Core & Core To Post	2.8	3.4	4.2	9.8	4.7	16.5	4.2	29.7
Core To Post	8.1	4.3	6.7	6.7	8.5	12.7	7.8	23.6
Post Only & Core To Post	4.0	4.6	3.5	7.6	3.9	12.6	3.8	24.8
Core Only, Core To Post, Post Only	4.7	4.5	5.8	10.7	4.4	12.1	4.9	27.4
Pre To Core & Core To Post	2.0	8.8	1.4	11.6	1.2	15.0	1.4	35.4
Three Or More Other Schedules	3.0	9.6	2.0	12.1	1.2	10.6	1.7	32.3
Less Than Three Other Periods	5.5	8.3	3.7	10.7	3.6	15.5	3.9	34.5
Total							100.0	25.7

PANEL B: FEMALE by Age of Youngest Child

Work Arrangements	<u>Pre-School Age</u>		<u>School Age</u>		<u>None</u>		Group Total	
	Percent of Total	Percent in Work Arrangement	Percent of Total	Percent in Work Arrangement	Percent of Total	Percent in Work Arrangement	Percent of Females	Percent in Work Arrangement
Core Only	54.2	1.8	57.7	6.5	67.4	15.2	63.3	23.4
Core Only & Pre To Core	2.0	0.6	2.3	2.5	2.7	5.9	2.5	9.1
Pre To Core	6.0	0.7	6.0	2.4	10.1	8.1	8.5	11.3
Core & Core To Post	4.0	1.9	3.3	5.4	2.5	8.2	2.9	15.5
Core To Post	22.3	4.6	13.1	9.3	7.6	10.9	10.6	24.8
Post Only & Core To Post	5.2	2.3	8.0	12.2	2.5	7.8	4.4	22.3
Core Only, Core To Post, Post Only	2.4	0.9	5.7	7.4	3.8	9.8	4.2	18.2
Pre To Core & Core To Post			0.6	3.4	0.6	7.5	0.6	10.9
Three Or More Other Schedules			0.7	3.0	1.0	8.6	0.8	11.6
Less Than Three Other Periods	4.0	2.4	2.6	5.2	1.8	7.4	2.2	15.0
Total							100.0	19.8

Table 8F - Work Time Arrangements Among Employed Workers, Gender and Age of Youngest Child, Netherlands, 1995

PANEL A: MALE by Age of Youngest Child

Work Arrangements	<u>Pre-School Age</u>		<u>School Age</u>		<u>None</u>		Group Total	
	Percent of Total	Percent in Work Arrangement	Percent of Total	Percent in Work Arrangement	Percent of Total	Percent in Work Arrangement	Percent of Males	Percent in Work Arrangement
Core Only	41.9	6.0	46.8	8.4	49.7	13.4	46.9	27.9
Core Only & Pre To Core	8.4	11.8	6.2	10.9	6.0	15.7	6.7	38.4
Pre To Core	23.8	12.3	19.0	12.3	16.6	16.1	19.1	40.7
Core & Core To Post	3.2	6.7	3.5	9.2	4.9	19.3	4.0	35.2
Core To Post	6.1	5.5	10.0	11.4	8.1	13.8	8.2	30.7
Post Only & Core To Post	4.6	9.0	2.7	6.6	3.7	13.5	3.6	29.1
Core Only, Core To Post, Post Only	4.6	7.7	4.8	10.0	4.9	15.4	4.8	33.1
Pre To Core & Core To Post	1.7	12.9	1.5	14.3	1.1	15.6	1.4	42.9
Three Or More Other Schedules	1.7	9.6	1.3	9.1	2.0	21.2	1.7	39.9
Less Than Three Other Periods	3.9	10.2	4.2	13.8	3.0	15.0	3.6	39.0
Total							100.0	31.8

PANEL B: FEMALE by Age of Youngest Child

Work Arrangements	<u>Pre-School Age</u>		<u>School Age</u>		<u>None</u>		Group Total	
	Percent of Total	Percent in Work Arrangement	Percent of Total	Percent in Work Arrangement	Percent of Total	Percent in Work Arrangement	Percent of Females	Percent in Work Arrangement
Core Only	67.0	5.0	65.4	9.0	67.1	14.2	66.5	28.2
Core Only & Pre To Core	1.4	1.0	2.6	3.4	3.3	6.7	2.7	11.1
Pre To Core	6.1	1.6	9.6	4.7	8.5	6.4	8.4	12.8
Core & Core To Post	2.6	2.9	2.0	4.0	4.1	12.6	3.1	19.5
Core To Post	9.4	4.4	8.7	7.6	6.6	8.8	7.8	20.8
Post Only & Core To Post	6.4	6.6	3.9	7.3	3.5	9.9	4.1	23.8
Core Only, Core To Post, Post Only	4.5	3.9	5.3	8.5	3.6	8.9	4.3	21.3
Pre To Core & Core To Post	0.2	0.7	0.3	2.0	0.7	8.2	0.5	10.9
Three Or More Other Schedules	0.7	2.0	0.8	4.0	1.2	10.1	1.0	16.2
Less Than Three Other Periods	1.7	2.4	1.5	3.8	1.4	5.2	1.5	11.4
Total							100.0	22.7