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Chapter 1

Nonstandard schedules and family cohesion – the study outline and central findings

1.1 Research questions

Nonstandard schedule work, such as work in early mornings, late evenings, nights, weekends, or bank holidays, is not a new phenomenon. For a long time it has been an integral part of many occupations including midwives, nurses, security guards, firemen, and farmers. The 'atypical' or 'off' time of the day or week when these work schedules take place has raised a growing concern about the impact of these schedules on individuals and families. This is due to the already considerable and growing amount of paid labor that now takes place in nonstandard times (Breedveld, 2006; Evans, Lippoldt, & Marianna, 2001). According to Presser (2003), two fifths of Americans work in nonstandard shifts or days. In twelve selected European countries, the prevalence of nonday work ranges from as low as 14.5% in Luxembourg to about twice that level in United Kingdom (29.4%) and The Netherlands (27.4%) (Presser, Gornick, & Parashar, 2008: 87). Although the latter study applies a slightly different definition for nonstandard schedule work than the study on America, the findings still indicate clearly a rather high prevalence of nonstandard schedule work in various European countries.

The impact of work in nonstandard schedules on workers can be broadly divided into individual and social consequences. A great deal of research has established that there are individual effects of these schedules, such as higher levels of stress and sleeping and physical disorders of workers in nonstandard schedules (Fenwick & Tausig, 2001; Jamal, 2004; Schulz, Cowan, Cowan, & Brennan, 2004). There is less clarity about social consequences of working these schedules. One stream of research finds no or a positive effect of these types of schedules on workers and their family. These are mostly related to

childcare activities where parents use nonstandard working times to arrange childcare (Presser, 1983) and respectively spend more time with children (Barnett, Gareis, & Brennan, 2008; Han & Waldfogel, 2007). Several others studies demonstrate, however, a significant negative impact on the relations between the workers and others, especially other members of the family (Hertz & Charlton, 1989; Perry-Jenkins, Goldberg, Pierce, & Sayer, 2007). The findings on reduced partnership quality and satisfaction (Weiss & Liss, 1988; White & Keith, 1990); less or reduced quality time with children (Han, 2005; Han, Miller, & Waldfogel, 2010; Strazdins, Korda, Lim, Broom, & D'Souza, 2004); and increased partnership dissolution risk (Presser, 2000; White & Keith, 1990) for those who work nonstandard schedules suggest that nonstandard schedule work has a strong (negative) impact on family cohesion (i.e. the quality and stability of relations between the family members).

Another distinct feature of previous research on nonstandard working time and consequences of these schedules is that majority of it have been carried out in the United States. Other country studies can be also found (Glorieux, Mestdag, & Minnen, 2008; Venn, 2004), but those remain scarce. The United States (as any other country) has to be seen, however, in its specific historical and institutional settings that shape most likely the role and meaning of these schedules in the society (Gornick & Meyers, 2003; Mills & Blossfeld, 2005) and therefore we do not know to what extent the findings are universal or rather a country-specific 'anomaly'. In other words, while individual consequences of working nonday hours can be treated as something rather universal – staying awake due to work duties during night shifts is physically exhausting for all those who do it (Jamal, 2004) – social effects can be better understood by placing them into wider contextual surroundings. Work time regulation and enforcement, shop and/or office opening hours, availability and accessibility of (child)care institutions all shape the meaning, perceptions and practice of nonstandard schedule work in society, and respectively the consequences that working these days and hours can have on individuals and families.

The central research question of the current study is to understand the impact of nonstandard working time on family cohesion. Three

aspects are central. First, individual level aspects are addressed such as what is one's occupation, whether work in nonstandard schedules is part of it, and how engaged individuals are in these schedules. Second, the household situation is considered such as presence of a partner' and/or children and partners working schedule. Third, the national institutional context such as regulation of working time and work in nonstandard times, availability and accessibility of (public) childcare facilities, and general prevalence of nonstandard schedule work is examined. It is also vital to understand the potential bi-directional impact of these schedules. On the one hand, the presence and nature of nonstandard work schedules is affected by various characteristics, on the other hand, nonstandard schedule work impacts workers and families. Considering all of these factors, the more detailed research questions of current study are as follows (also summarized in Table 1):

- Where are nonstandard schedules located and who gets engaged in them?
- What is the impact of nonstandard schedule work on family cohesion?
- What is the role of institutional settings on location and impact of nonstandard schedule working time?

The aim of the first research question is to examine the impact of individual, social and societal aspects on nonstandard schedule work – its prevalence, practice and meaning – in order to understand the phenomenon of nonstandard schedule work on both individual and societal level. To achieve this goal, the thesis focuses firstly on where in the labor market these nonstandard schedules are located. Central questions here are: whether and in which occupations tend nonstandard schedules concentrate; and whether nonstandard schedule work and workers can be characterized by specific employment features. A second focus is on the household and its role in shaping the prevalence of nonstandard schedule work by asking whether any household features (e.g. presence and status of partner, presence and age of children) increase or decrease the chance of nonstandard schedule work. This research question is examined in detail in chapter 2 of this dissertation.

The second research question builds on the potential bi-directional impact and thus the intertwined nature of partners and children in the

household. It examines the impact that working these schedule potentially have on workers and their families. Working nonstandard schedules has the potential to put worker(s) 'out of the sync' with the rest of the family as well as society in general, creating great challenges for family cohesion. Since the surrounding institutional context where the adults and children are involved in their everyday life (e.g. office and shop opening hours, kindergartens, schools, entertainment facilities, etc.) generally functions 'standard' times, families with nonstandard schedule workers may be inhibited in spending leisure time together, or jointly participating in social activities outside of home. They may be also losing out in the time that they can spend with each other, leading to reduced time and quality of family interactions (Lesnard, 2008).

In order to assess the impact of work in nonstandard schedules on parent-child interaction, the study in chapter 3 examines how parents' work in nonstandard schedules affects their time and activities with children. To assess the impact of nonstandard schedule working times on the interaction between partners, chapter 4 focuses on the consequences of working in nonstandard schedules on partnership quality (the level of conflict in the partnership and general (dis)satisfaction with the relationship). In order to assess the long-term effect of nonstandard schedule work on family cohesion, chapter 5 focuses on the impact nonstandard schedule work on partnership stability and specifically whether having nonstandard schedule workers in the household will increase the risk of partnership dissolution.

While the first and second research question examine the bi-directional impact between nonstandard schedules and workers, the third research question focuses on the moderating effect of wider contextual matters. More precisely, it aims at revealing and disentangling the role and function of country-specific institutional context on prevalence, location and impact of nonstandard schedule work. In order to study the role of institutions, a (country) comparison is applied. The Dutch context central to this study is compared to the case of United States, so far the most studied country on this topic. While the role of institutional context will be discussed throughout all the chapters, the country differences will be directly tested in chapter 2 and chapter 5.

Table 1 Thesis outline

Research question	Chapter	Core studied variables
Where are nonstandard schedules located and who gets engaged in them?	Chapter 2: Who works nonstandard schedules? The role of occupational, household and institutional factors.	Dependent variables: working schedules; earnings; Independent variables: occupational and household characteristics.
What is the impact of nonstandard schedule work on family cohesion?	Chapter 3: Nonstandard work schedules, couple desynchronization and parent-child interaction: A mixed-method couple analysis.	Dependent variables: number of joint family meals, time spent with children, child-care activities; Independent variables: working schedules (partners' schedule combinations)
	Chapter 4: Nonstandard work schedules and partnership quality: Quantitative and qualitative findings.	Dependent variables: perceived level of partnership conflict, perceived level of partnership dissatisfaction; Independent variables: working schedules (individual schedules; partner's schedules)
	Chapter 5: Nonstandard work scheduled and partnership dissolution: A comparative analysis between The Netherlands and the U.S.	Dependent variable: partnership dissolution (partnership state changes between wave 1 and wave 2) Independent variables: working schedules (individual schedules, partners' schedule combinations)
What is the role of institutional settings on location and impact of nonstandard schedule working time?	Discussed in all chapters; country differences statistically tested in Chapter 2 and Chapter 5.	Working time regulations (regulatory mechanism, regulation level, part-time work); work-family policies (presence, availability and accessibility of public childcare)

The four chapters (chapters 2, 3, 4, and 5) are built up and organized as four separate articles. The current chapter – Chapter 1 – presents the general outline of the dissertation. In addition to outlining the central research questions of the thesis, this chapter discusses measurement issues related to capturing work in nonstandard times, some aspects related to the unit of the analysis, and the importance of Dutch country case for this topic. The chapter also describes the central findings of each chapter/study and their contribution to answering research questions. The chapter is concluded with a discussion of the findings and (policy) implications of current research.

1.2 Unit of the analysis – individual or household

Nonstandard schedules are generally examined at the unit of the analysis of the individual: it is individuals that are employed in these schedules. However, the household context plays a pivotal role in individuals' (self)selection into nonstandard schedule work. For example, one partner's nonstandard schedule working time may affect the other partner's preference or ability to work similar schedules so that they can spend more time together (Venn, 2004). In a similar manner, when young children who require care are present in the household, in the face of limited (public) childcare facilities, one partner may switch to nonstandard working times while other works in standard schedules so that partners can desynchronize their schedules (Carriero, Ghysels, & van Klaveren, 2009; Lesnard, 2008) and share the child care tasks (Strazdins, Clements, Korda, Broom, & D'Souza, 2006; Wight, Raley, & Bianchi, 2008).

Thus, since the decision to work nonstandard schedules often takes place not only at individual, but at the household level (G. Becker, 1981), the current study expands upon the phenomenon of nonstandard schedule work and its impact on household rather than individual level and works respectively with couple rather than individual data. The approach is to analyze the individual and working schedules in the household context, considering the presence of the partner, partner's employment status and partner's working schedule. A central interest here is whether and to what extent partners combine – synchronize and *desynchronize* – their paid

work outside household (Lesnard, 2008). Synchronization of schedules refers to the situation where partners are engaged in paid work during same (standard or nonstandard) hours and days. Desynchronization of schedules refers to partners' engagement in paid work during different hours and days, such as one partner working in standard and the other in nonstandard times. The issue of couples' schedule co-ordination is discussed in detail within the chapters of the thesis. In addition, based on the respondent and partner's employment status, employment schedule, and employment load, a classification of various household types was created and applied in chapter 3 (analyzing the impact of nonstandard schedules on parent-child interaction) and chapter 5 (analyzing the impact of nonstandard schedule work on partnership stability).

1.3 The case of The Netherlands

As stated earlier, majority of research on nonstandard schedule work has been carried out in the United States. Since the current study is a Dutch country study, it introduces a new case and adds a comparative perspective to this body of research. The Netherlands is an interesting case to study the phenomenon of nonstandard working schedules for several reasons. Firstly, it has a relatively high prevalence of nonstandard schedules, and is in fact one of the highest in Europe. In 2005, 27.4% of Dutch workers reported working often or regularly in nonstandard times (Presser et al., 2008). Thus, the issue of nonstandard schedules is clearly important, yet it has been rarely empirically studied (for exceptions see for example Breedveld, 1998; Carriero et al., 2009; Tijdens, 1998).

Secondly, in last decades the Dutch household has undergone dramatic changes with the traditional male single-earner family replaced by one-and-half earner family model. This is due to an increasing number of women entering into paid employment (OECD, 2002). The most dramatic change has been in households with young children, where the amount of partners employed (part-time or full-time) has doubled, and as of 2000 was two out of three families (CBS, 2002). Thus, even when the proportion of work carried out outside standard working time has not changed over last decades (Breedveld, 2006), the practice of these schedules must have been

increasing in absolute terms, and respectively more households are exposed to nonstandard schedules.

Thirdly, more recently there have been various attempts to flexibilize the Dutch labor market, including reforms affecting the working time regulations and nonstandard working times (Fouarge & Baaijens, 2004; Jacobs, 2004). Extending shop opening hours, and the consideration of work during the weekends demonstrates that the role of nonstandard working times may become more pivotal within Dutch society. Thus, the issue of the practice, location and impact of nonstandard schedules has gained relevance for Dutch society.

Fourthly, The Netherlands is one of the leading economies in terms of the use of part-time work. Not only is part-time work widely practiced (35% of all workers, mostly women) (OECD, 2009a), part-timers and full-timers enjoy similar conditions of employment (Fouarge & Baaijens, 2009). The latter makes working part-time an attractive choice, especially when combining work and family, but also when having to work nonstandard schedules. Thus, studying the Dutch case adds new factors to the existing knowledge on the association between work schedules and number of work hours.

Finally, studying The Netherlands provides a rather different and challenging country case – both in terms of how the round-the-clock economy is perceived mentally as well as regulated by laws (Gornick & Meyers, 2003). The Netherlands as a representative of European case makes the comparison with American case especially interesting and fruitful.

1.4 Defining nonstandard schedules

The ways to operationalize nonstandard schedules vary considerably: from counting all the hours outside certain days and times of the day, to including only strict categories that reflect certain working patterns (for example see Breedveld, 1998; Golden, 2001; Presser, 2003; Venn, 2003). The diversity in definitions (and operationalizations) is partly attributed to the variety in legal regulations and the heterogeneity within working time length and organization. This, in turn, must partly explain the sometimes

remarkable differences in the prevalence and impact of work in nonstandard times within and between countries (Beers, 2000; Evans et al., 2001; Hamermesh, 1999; Presser, 2003).

Despite the variety of definitions, there tends to be a general agreement that nonstandard working schedules include at least two temporal dimensions – hours and days. One of the main arguments for differentiating between days and hours is the potential impact that working in these times has on worker's lives (Fenwick & Tausig, 2001; White & Keith, 1990). While working in the evening and nights tends to have strong physical and psychological effect on workers, the consequences of weekend (day) work are predominantly social (Davis, Goodman, Pirretti, & Almeida, 2008).

The current study also differentiates between nonstandard hours and days. For categorizing nonstandard hours, the definition uses the 'majority' criteria (for more see Presser, 2003). The majority rule derives shifts from the majority of hours worked in majority of the days of the week, regardless of whether they are in weekdays or weekends. Different shifts are then defined as follows: day shifts are when the majority of hours are worked between 08:00 and 16:00; evening shifts when these hours are between 16:00 and 24:00; and night shifts are assumed when the most hours are worked between 0:00 and 08:00. When no clear shift pattern can be distinguished, but work takes place in nonstandard hours, the shift is defined as 'hours vary'. Nonstandard days, in turn, are defined as day shifts where all or part of the work takes place during weekend days (Saturday and/or Sunday). Standard schedules refer to day shifts which are worked during weekdays (Monday to Friday). (For the syntax of creating the 'nonstandard day' and 'nonstandard shift' work variables, please see 1.7. Appendix).

For illustration, Figure 1 presents examples of working weeks – number and location of hours worked every day of the week – of regular day, weekend day, evening, night, varying hours shift workers. As can be seen in example A (day shift, weekdays only), the person is working for a total of 42 hours a week. According to nonstandard shift definition, out of these 42 hours, 36.5 hours take place in 'day hours', 3.5 hours take place in 'evening hours', and 1 hour takes place in 'night hours'. In all worked days, the majority of the hours are worked during day hours, which makes the person a 'day shift worker'. The weekdays when s/he is working are

standard workdays (Monday to Friday) only, which together makes the person a 'standard schedule worker'.

In example B (day shift, weekend day), the person works 47 hours a week. Out of all the hours, 35.5 are worked during day hours and 11.5 are worked in the evening hours. From all of the worked days, the dominant pattern is day hours, which makes the person a 'day shift worker'. However, different from the previous example, one of the worked days is a weekend day (Saturday), which makes the person according to the applied definition a 'nonstandard schedule worker', more precisely a 'weekend day worker'.

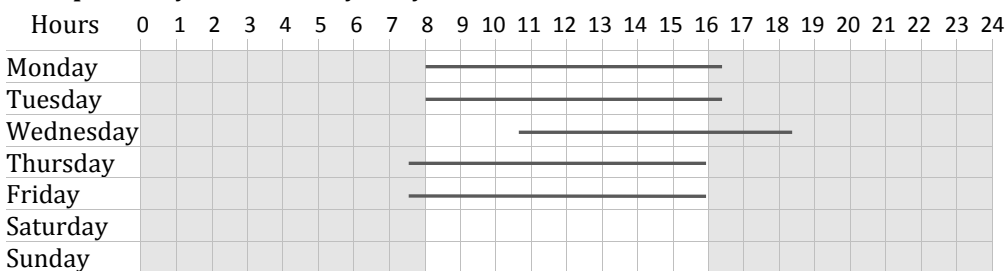
Example C (evening shift) shows a person who works in total 32 hours a week. From all of the worked hours, 8 hours take place during 'day hours' and 23 take place during 'evening hours' and 1 takes place during the 'night hours'. Out of all worked days, the dominant working time is evening hours, which makes the person a 'evening shift worker'.

Next example (D) illustrates a working week of a night worker. This person works out of the total 31 hours 6 in day hours, 8 in evening hours, and 17 in night hours. Out of all worked hours, the majority takes place in night hours which makes the person a 'night shift worker'. Note that part of the Friday's work takes place in Saturday night, which is a weekend day. However, according to the applied definition, working hours 'rule' over the working days, which makes the person a night worker despite some of the working taking place in the weekend.

Example E shows a working week of a person who is classified as working varying hours. Out of the 45 worked hours, 13 take place during the day, 16 take place during the evening and 16 take place during the night time. In most days, the person works during nonstandard hours (compared to standard day hours), which makes him/her by definition a nonstandard schedule worker. As there is no dominant pattern in the hours that are worked in nonstandard times, the person is classified as working varying hours. Similar to the example D, also here some of the working time takes place during weekend days. However, according to the worked hours the person is already classified as a nonstandard schedule worker and hours rule over the days, there is no need to regard additionally the days of the week when the work takes place.

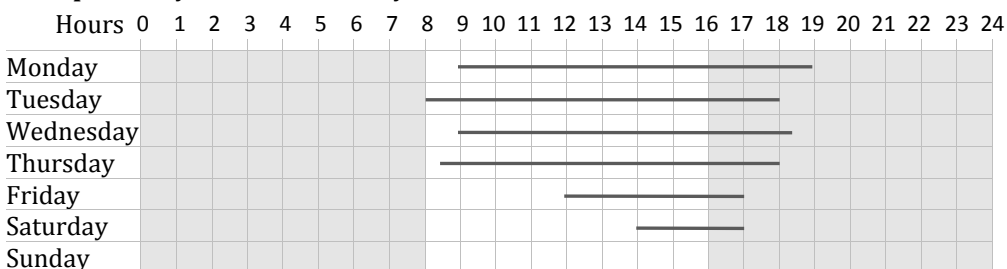
Figure 1 Examples of operationalization of nonstandard working schedules

Example A: day shift, weekdays only



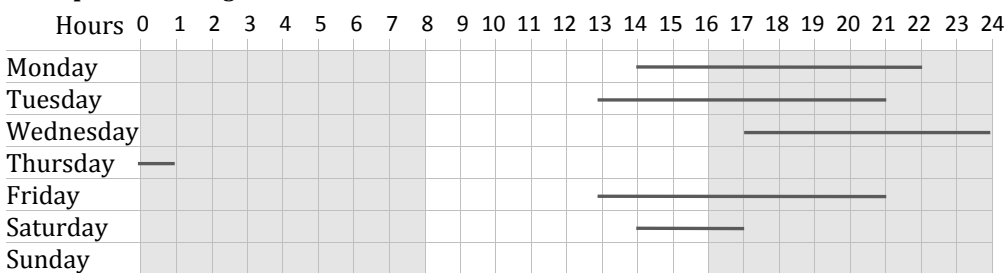
Note: — - working time

Example B: day shift, weekend day



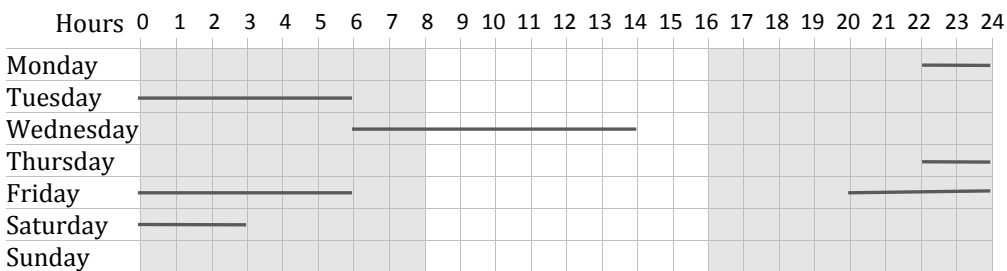
Note: — - working time

Example C: evening shift



Note: — - working time

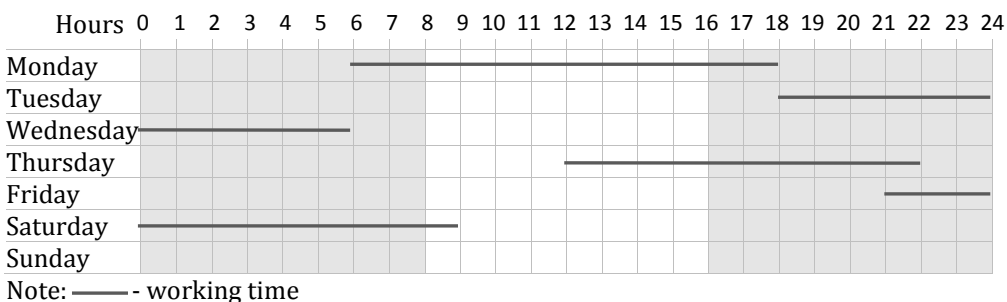
Example D: night shift



Note: — - working time

Figure 1 *Continued*

Example E: hours vary

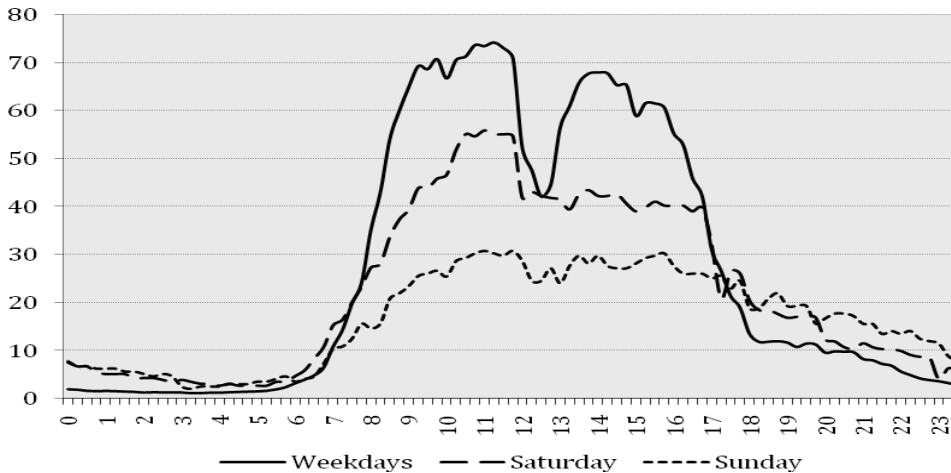


Compared to other definitions, ‘majority-rule’-definition has several advantages. Firstly, it provides clear, mutually exclusive categories of different schedule types. Secondly, it allows differentiation between individuals randomly or occasionally working nonstandard times and individuals who are regularly engaged in them. Thirdly, the definition is used in many other studies, especially in the work of Harriet Presser (2003), one of the leading researchers in the field, on the United States. Using the same operationalization allows a more systematic comparison between The Netherlands and (previous findings on) the United States. Finally, the definition follows to a great extent the existing working time pattern of Dutch workers. As can be seen in Figure 2, majority of those actively involved in labor market in The Netherlands start their working day between 8 and 9 o’clock in the morning, and finish it between 16 and 17 o’clock. Thus, a ‘typical’ or ‘standard’ working day falls between the 8 and 16 o’clock. Also during the Saturday, the majority of those hours that are worked fall between this time-frame, although in weekend days, hours are in general more spread over the day than in an average weekday.

One of the weaknesses and limitations of the above-described definition is that in its categorical representation it is insensitive to the number of hours worked in these schedules. On the one hand, it may underestimate overtime work. On the other hand, even those who work very few hours (for example only in the weekends) are assigned into one of the schedule categories. While overtime work is not a big issue in The Netherlands (Evans et al., 2001), part-time work is, and the issue of number

of working hours is therefore addressed and controlled for throughout the whole study.

Figure 2 Proportion of work carried out in certain hours in The Netherlands



Source: Time-budget Survey (TBO) 2000; author's calculations

Note: Proportions refers only to those who are working. Working time excludes travel to/from work and coffee/lunch/dinner breaks.

1.5 Data and method

The central data source of this study is the Netherlands Kinship Panel Study (NKPS) (Dykstra et al., 2004). The NKPS is a multi-actor, multi-method panel study with data collected from a random sample of individuals within private households in The Netherlands, aged 18 to 79. The first wave of the data (N = 8,161), which will be used as the main data throughout current research, was collected in 2002-04. The second wave of the NKPS data (N = 6,091) was collected about five years later, in 2007-08. Details about the used sub-samples, data quality, as well as panel attrition are discussed in every chapter separately.

For the comparisons with the United States (direct comparisons are carried out in Chapter 2 and in Chapter 5), the data comes from the first and second panel wave of the U.S. National Survey of Families and Households (NSFH) (Sweet, Bumpass, & Call, 1988). The first wave of the

NSFH took place in 1987/88 (N = 13,007) and the second wave data was collected in 1992 (N = 10,005). The data is a national probability sample of men and women aged 19 and over. As the NSFH was to a great extent a model for NKPS survey design, the two data sets are highly comparable.

Next to the quantitative data, some parts of the research (Chapter 3 on the impact of nonstandard schedule work on parent-child interaction, and Chapter 4 on the impact of nonstandard schedules on partnership quality) uses also qualitative data. Although the NKPS provides detailed information on respondents and partners working schedules as well as perceptions on partnership quality and various family interactions in The Netherlands, the quantitative data becomes challenged for describing the ways and mechanisms of how nonstandard schedules are integrated into household time-structure. Also, the quantitative data provides little information on personal perceptions on why these schedules are worked and how workers and families experience them. Therefore, the study uses also qualitative data coming from the NKPS Mini-Panel “The Impact of Nonstandard Working Schedules on Partnership Quality and Stability” (Mills & Hutter, 2007). Using a purposive sampling strategy (Marshall & Rossman, 1999), a sample was drawn from the first wave of the NKPS quantitative survey. The data consists of semi-structured interviews with 34 individuals and couples, where at least one of the respondents is or has been engaged in nonstandard schedules. The interviews were carried out three years after the first wave of data collection of the quantitative study, making it longitudinal in nature.

1.6 Central findings

1.6.1 Where are nonstandard schedules located and who gets engaged in them?

The first research question – ‘Where are nonstandard schedules located and who gets engaged in them?’ – is expanded upon in Chapter 2. The main questions to be asked here are: ‘Where are nonstandard schedules located?’, ‘Who engages in them?’, and ‘Are there any universal features regarding the prevalence and location of nonstandard schedule work?’ The focus of the paper is on the interplay between characteristics such as

occupational, household, and institutional factors, in shaping the prevalence and location of these schedules. To achieve this goal, the paper applies both a labor demand (occupational) and labor supply (household) theoretical perspective. A third dimension is the country-specific context and specifically work-time regulation and work-family policies. The study takes a comparative approach by analyzing and contrasting the findings of The Netherlands and the United States, two countries with a high prevalence of nonstandard schedule work, but quite different institutional regulations. It uses sub-samples of two national representative data sets, the first wave of the Netherlands Kinship Panel Study (N=4,344) and the first wave of the [U.S.] National Survey of Families and Households (N=7,801).

The central finding and conclusion of the chapter is that despite the prevalent argument of an ever emerging 24-hour-economy, nonstandard schedules seem not have penetrated all societies, even in countries where the prevalence of these schedules is very high (such as in the United States or The Netherlands). Rather, the prevalence and location of nonstandard schedules is very much shaped by various individual, occupational, and household characteristics. Although occupation is still the main characteristic explaining engagement in these schedules, the findings of both countries show that work in these schedules is also a household issue. Moreover, the impact of these various characteristics is shaped by a more general country-specific context, such as the regulation of working time and work-family policies. The lack of regulation and employment protection of nonstandard schedule work may lead to a marginalization of these schedules and to a concentration into already disadvantaged labor market segments. Stronger regulation and implementation of various 'buffer-mechanisms', on the other hand, protects workers against the 'unhealthy' effect of the schedules and allows them to be more general jobs, and not necessarily bad jobs.

In relation to occupational aspects, nonstandard schedules tend to be strongly concentrated in some occupations such as nurses, midwives, cashiers, restaurant workers, sales persons, plant operators, drivers, and cleaners. Another characteristic of nonstandard schedule work is that these schedules, especially nonstandard shifts, are more likely to accumulate in lower level positions. As a motivation mechanism, work in nonstandard

schedules (especially night shifts) is often compensated with some extra pay. Nonstandard schedule work is also very often part-time, especially in the case of shift work or very long hours such as weekend schedules. Where working time restrictions are more stringent – such as in The Netherlands – nonstandard schedule work tends to have somewhat different character. Nonstandard schedules are not wide-spread, but rather very much concentrated into a few jobs, where work in these times is often unavoidable. The association between part-time work and nonstandard schedule work is clearer, as almost penalty-free work-time reduction can in this case function as an efficient buffer-mechanism. The wage compensation mechanisms that exist is also stronger compared to country-context where no central regulation mechanism for nonstandard schedule work exists.

Although to a lesser extent, next to occupational aspects household characteristics also shape the prevalence and location of nonstandard schedules. Similar to occupational aspects, here there are both universal and country-specific features. A general positive association between partners' nonstandard schedule work seems to exist. One partner's work in nonstandard schedules increases their partner's probability to work in respective schedules, leading to what is often termed schedule synchronization (Carriero et al., 2009; Lesnard, 2008). When having young children in the household who need care, the propensity to work nonstandard schedules also tends to rise. However, it may also be that partners move to desynchronized schedules – while one partner is taking care of children, the other is working and the other way round. When considering the impact of household composition on nonstandard schedule work, the institutional context and work-family policies also make a difference. In The Netherlands, engaging in these schedules for household-related reasons seems more likely a matter of preference and not so much a forced need, which was found in the U.S. In other words, in The Netherlands, nonstandard schedules do not have an overly negative connotation and meaning, which allows the families to decide to use nonstandard schedules as a way to spend more time with children or arrange child-care between the partners. In the rather marginal employment situation of nonstandard schedule work, such as in the U.S., the use of these schedules for household purposes might be much more of a

forced choice of the specific type of households who cannot afford or have no access to (public) childcare facilities.

1.6.2 What is the impact of working nonstandard schedules on family cohesion?

1.6.2.1 Parent-child interaction

The second research question asks: ‘What is the impact of nonstandard schedules on family cohesion?’ This is the central topic of chapters 3, 4 and 5. Chapter 3 elaborates on the issue of combining nonstandard schedules and parenthood in The Netherlands by studying the way nonstandard schedules are integrated into household arrangements of families with (young) children, and assessing the impact that working these schedules has on parent-child interaction (joint family activities, time spent with children, child-care activities). To achieve this goal, the chapter 3 explores two competing hypotheses of whether nonstandard schedules result in lower levels of parent-child interaction or conversely, whether parents use nonstandard schedules to spend more time with children. The study applies a multi-method approach to examine the impact of nonstandard schedules on parent-child interaction, including activities together with children and the division of child-care and rearing related tasks between parents. For this it uses a sub-sample of the first wave of the Netherlands Kinship Panel Study (N = 1,266 couples with young children) and semi-structured individual (N=27) qualitative interviews of respondents with children from the NKPS Mini-Panel.

The main finding is that in The Netherlands, work in nonstandard schedules appears to allow parents to increase parent-child interaction. The many negative effects of extreme physical strain and a poorer labor market position that have been related to nonstandard schedules and are often carried over to household interactions seem not to hold in The Netherlands. However, not all parents are equally successful: the impact on parent-child interactions depends on which of the parents is engaged in nonstandard schedules; and while gaining in personal parent-child interaction, parents often spend less time in joint family activities.

The first set of findings show that many Dutch households engage in nonstandard schedule work when they have young children. It is often their conscious choice to desynchronize and combine work and family via

nonstandard schedules in order to arrange child-care activities better, spend more time with children and be 'parents on demand'. But it is not only nonstandard schedules, but also the country-specific contextual aspects that seem to play a significant role. Cultural norms in The Netherlands hold a less positive view of institutional childcare and working mothers. Relatively expensive and limited child-care and the school hours of younger children also implicitly assume that one parent needs to be home or work reduced hours. At the same time, due to high employment protection and working-time regulations, part-time employees receive comparable benefits and wages to those working full-time and reduced working hours does not undermine their labor market position. This makes it easy to combine part-time work and nonstandard schedules. Respectively, due to its often voluntary nature and supportive institutional context, working nonstandard schedules in order to arrange child-care and family life appears to have less negative consequences for families in The Netherlands.

The second set of findings indicates a strong gender effect. For fathers, working nonstandard shifts significantly increased the time spent in activities with children. For mothers, however, working nonstandard schedules did not seem to increase their time spent with children, nor did it reduce it. Clear gender differences also appear when it comes to the division of daily child-care activities such as taking children to school, staying at home when children are sick, or getting out of bed at night. Especially for fathers, their involvement in nonstandard schedules increases their share in child-care activities, whereas in some cases it significantly reduces the mother's share of daily child-rearing tasks. Another finding was that fathers reduced working hours particularly in combination with nonstandard schedules, which allowed them to participate more in family life, which may be more unique to the Dutch context. Even though a male breadwinner or one-and-a-half earner family model are the dominant family structures, it is also men who modify their work schedules according to family needs.

The third set of findings shows that even when combining family-time via working nonstandard schedules and this allows the parents to gain more time for parent-child interaction, a loss of time still exists. Although increasing personal time between parents and children, work in

nonstandard schedules has a tendency to reduce shared family time. Families with nonstandard schedule worker(s) have joint family dinners less often, an important family gathering event of the day. Also, when desynchronizing their schedules, parents increase their personal time with children, but reduce their time joint time as partners. While one of them is home, the other is out. The impact of working nonstandard schedules on partnerships, which is another dimension of family cohesion, is the subject of the next chapter (Chapter 4).

1.6.2.2 Partnership quality

Chapter 4 focuses on consequences of nonstandard schedule work on partnership quality. The main research questions of this study were: 'What is the impact of nonstandard schedule work on partnership quality?', and 'Are the previous findings on the impact of nonstandard schedules on partnership universal or rather specific to the (U.S.) country context where the majority of research has been conducted?' The study uses a mixed-method approach based on the data from the Netherlands Kinship Panel Study (NKPS) (N = 3,016 couples) and semi-structured qualitative interviews from NKPS Mini-Panel (N = 34 individuals in couple relationships). The core dependent variables of the analysis were the self-reported level of conflict in partnerships (four-item scale) and level of (dis)satisfaction with the partnership (four-item scale).

The central finding and conclusion of the paper is that, in general, in The Netherlands there is no predominantly negative effect of nonstandard schedules on partnership quality. In some cases even a positive effect of work in nonstandard times on the perceived partnership quality is found. This lack of a clear negative effect of nonstandard schedule work on partnership quality can be partly attributed to the Dutch country context, where working time is generally well regulated, various laws and agreements protect workers against the 'unhealthy' effect of nonstandard schedule work, and where various buffer-mechanisms are in place against accumulation of nonstandard schedule work related stress. However, even in this context there are some adverse links between working schedules and partnership quality that indicate that not all couples are spared from negative consequences when one or both partners work nonstandard schedules. The impact of nonstandard schedules is shaped by various

couple and relationship characteristics, by household composition and by general country-contextual aspects that shape the meaning and role of nonstandard schedule work in society.

The first key finding was that only schedules with varying hours had a clear impact on relationship quality. Moreover, there was not only an absence of any overwhelmingly negative effect of nonstandard schedules, but also a positive effect of such schedules for men. Schedules with varying hours had a negative impact on women's relationship quality and a positive impact on men's relationship quality. Such schedules increased relationship dissatisfaction for women but decreased the level of conflict in relationships for men.

The second key finding is that the divergent, gendered impact of schedules with varying hours is tied to the presence of young children. When men with young children had more varying hours, there was a significant reduction in relationship conflict. Parents reported adapting their schedules to engage in tag-team parenting to ensure that one parent was at home with the children. Fathers who adapted their schedules and those who had partners who worked nonstandard schedules reported being more involved in child care. Women, however, were less satisfied in their relationships when they had young children and engaged in varied hours, which could be related to higher levels of stress and guilt.

A third key finding is that partner support is crucial factor enabling individuals to work nonstandard schedules and maintain a good relationship. Men who received less partner support and worked during weekends experienced more dissatisfaction in their relationship. Conversely, women received more support and were more satisfied with their relationships when they worked on the weekend.

Thus, there appear to be some universal effects of nonstandard schedules, such as a negative impact on mothers with young children and the use of nonstandard schedules for tag-team parenting. But some findings did not hold, such as the lack of any negative effect of night shifts or the positive effect of varied hours on men's relationships, which signals that many of the 'universal' effects of such schedules may not hold outside of the United States.

Chapter 4 does not address the issue of the long-term effect of working nonstandard schedules on partnerships. Even when conflict levels seem not

to significantly increase in The Netherlands when partners work nonstandard schedules, working these unhealthy days and hours must reduce the time partners can spend together and/or with family. The impact of nonstandard schedule work on family cohesion in a long-term perspective – on partnership stability – is therefore the subject of chapter 5.

1.6.2.3 Partnership stability

Chapter 5 explores the impact of nonstandard schedule work on another family cohesion dimension – partnership stability. The central research question of this study is: ‘How does work in nonstandard schedules affect long-term partnerships outcomes, more precisely partnership dissolution risk?’ It also examines the role of various individual, household, and institutional factors in shaping the impact of nonstandard schedules on partnership stability. Due to previous – predominantly U.S. findings – the focus of this chapter is on the role of the country context such as the divorce culture/rate and work time regulation in the effect that nonstandard work schedules have on partnership stability. The study is designed as a country-comparison and uses data from the Netherlands Kinship Panel Study (first and second panel wave; N=2,982) and the [U.S.] National Survey of Families and Households (first and second panel wave; N=4,919). The time between panel waves is about four years, which means that the impact of nonstandard schedule work on partnership dissolution risk is assessed for a 4-year period.

The central finding of the chapter is that work in nonstandard schedules tends to increase the partnership dissolution risk. Both the theoretical arguments as well as the findings suggest that various factors shape the impact of nonstandard schedules on partnership dissolution risk. Key factors include: the type of schedules combined between couples, the gender of the nonstandard schedule worker, the working time arrangement, and the presence of (young) children in the household. Contrary to expectations, the impact seems only very modestly shaped by the divorce culture and the labor market and welfare regime context of the country where these scheduled are worked.

The first main conclusion is that when a nonstandard schedule worker is in the household, the risk of partnership dissolution risk increases over

time. The latter holds both when studying only the main effect of nonstandard schedule work, as well as when taking into account partner's working schedule and the way both partners' schedules are combined. The effect is rather stable also when controlling for various partnership characteristics such as partners' satisfaction with their relationship and the duration of the partnership.

The second main conclusion is that here is a gender-effect in the impact of nonstandard schedule work on partnership dissolution. The risk for partnership dissolution risk is somewhat higher when nonstandard schedules are worked by women. This suggests a strong traditional expectation towards women's behavior regarding household and paid work. When considering paid labor, employment during the traditionally 'family' hours means that women strongly deviate from their traditional role of housekeepers. The gender effect is even more evident when looking at the number of worked hours. An increase in the partnership dissolution risk is stronger in the case of women's full-time engagement in the labor market, no matter whether it is worked in standard or nonstandard schedules.

The third main conclusion relates to the impact of nonstandard schedule work on partnership stability. An important role is the household composition where these schedules take place. Namely, the combination of working schedules between the partners and the presence and age of children. The disruptive effect is stronger when partners have *desynchronized* their working schedules, such as one working in standard and the other in nonstandard times. This finding is especially relevant in the backdrop of households' strong tendency to consciously *desynchronize* their schedules (so-called tag-team parenting) in order to arrange child-care. In other words, when solving their child-care problems, partners themselves may create partnership problems in the long run. Even when having young children somewhat reduces the disruptive effect of work in these schedules on partnership stability, the negative main effect remains. One of the explanations for the impact of young children in reducing the negative impact of nonstandard schedule work on partnership dissolution risk is that when the schedules seem to have a certain function for the household, the impact on the partnership is not as disruptive.

The findings regarding country-context-effects remain somewhat ambiguous. The data shows that an increased partnership dissolution risk is present even in countries where more protective working time regulations provide the households with various buffer-mechanisms and flexibility against the negative impact of working the unhealthy schedules. In The Netherlands, where the protection against the unhealthy consequences of the schedules is stronger, the negative impact of working these schedules on partnership stability is also weaker. For American couples, it is the opposite. They are more at risk of partnership dissolution when engaged in nonstandard schedule work. Even so, Dutch couples are still at a significant risk of experiencing partnership dissolution when having nonstandard schedule worker(s) in the family, especially when they are worked in a desynchronized mode.

1.6.3 What is the role of country-context?

The third research question asks: 'What is the role of country-context in the prevalence, locations and impact of nonstandard schedule work on family cohesion?' This question is pervasive throughout all the four chapters of this thesis. For a better understanding of the potential role and impact of institutional context in shaping nonstandard schedule work, the Dutch country-case was compared with the United States. A direct comparison has been carried out in Chapter 2 (on where are nonstandard schedules located) and Chapter 5 (on the impact of nonstandard schedule work on partnership dissolution risk). The other two studies (Chapter 3 on the impact of nonstandard schedule work on parent-child interaction and Chapter 4 on the impact of these schedules on partnership quality) compare the Dutch findings with previous American findings and discuss the Dutch findings in the wider institutional contexts pointing out the differences between the United States and the Netherlands. The main country-specific institutional aspects that shape the prevalence, location and impact of nonstandard schedule work are also considered and discussed. These include: the working time regulations (e.g. presence and level of regulation working time; compensation mechanism for working nonstandard times; availability of 'buffer'-mechanisms such as part-time work), and work-family policies (availability of public child-care facilities).

The role of cultural, industrial relations and economic context related to the specific country context is often underestimated or even ignored in the analysis regarding work in nonstandard schedules and its impact on family cohesion. The findings of this current thesis shows that the institutional context does play a role in shaping the meaning, prevalence, locations and the consequences of nonstandard schedule work on workers and families. The way that nonstandard schedule working time is regulated and organized politically, occupationally and individually can soften the disruptive impact of work in these unhealthy days and hours by controlling and neutralizing the negative consequences. It can also boost the negative consequences even more when work in these schedules is of marginal nature. Although there seem to exist various universal trends regarding nonstandard schedule work (reasons why they are worked; location of these schedules in labor market and households) many associations and impacts tend to be context-specific associations and could be explained by the country context.

In the Netherlands some 'buffer'-mechanisms exist such as the prevalent and efficient combining of nonstandard schedules and part-time work. In the U.S., in turn, nonstandard schedule work has a strong tendency to concentrate into lower level jobs, is worse paid, and worked by those in an already more vulnerable labor market situation. Moreover, part-time work in the U.S. is a significantly more vulnerable labor market position than full-time work, which means that the combination of nonstandard schedule and part-time work holds a different meaning than in The Netherlands. As a result, work in nonstandard schedules in The Netherlands does not hold the overall negative connotations that it has been in the U.S. and working in these schedules in The Netherlands is much more likely related to preference and not a forced choice, which is often the case in the U.S.

The impact that working these schedules has on family cohesion also differs between the two countries. The impact of nonstandard schedule work on family cohesion in The Netherlands examined throughout the four chapters shows a rather modest negative effect (except for partnership dissolution risk) compared to the generally negative effect found in the U.S. Although Dutch nonstandard schedule workers tend to miss out on family activities such as dinners, parents (and especially fathers) who choose

nonstandard schedule work tend to increase their time in parent-child interaction and their participation in child-caring activities. Also there is a slight decrease in partnership quality when partners work in nonstandard schedules, but the effect is rather marginal. The negative effect is somewhat clearer in the Dutch case when examining the long-term effect, such as the impact of nonstandard schedule work on partnership stability. Although less than in the U.S., Dutch couples are also more likely to separate when one or both partners work in nonstandard schedules.

1.7 Discussion and (policy) implications

The aim of the current study was to describe and characterize nonstandard schedule work in The Netherlands focusing on where it is worked; by who it is worked; and the (social) consequences of working these schedules. All four studies showed that work in nonstandard schedules creates challenges for family cohesion. It impacts the interaction between the partners and between parents and children by shaping the quality, intensity, and stability of these different household relations. Although in comparison to previous – mostly U.S. – findings, the impact of nonstandard schedule work on family cohesion in The Netherlands seems modest. Yet Dutch families also suffer from negative consequences when one or more family members is engaged in nonstandard schedule work. In the backdrop of the high prevalence of nonstandard schedule work in the Netherlands, U.S. and many other countries (Presser et al., 2008), understanding the mechanisms and factors that shape not only the presence, but also the way nonstandard schedule work affects households and household relations becomes increasingly important. Moreover, it raises the question of whether and how the predominantly negative impact of nonstandard schedule work on family cohesion can be buffered or neutralized.

The current study, like most previous studies on the topic, focused on describing the factors that impact either workers/households engagement in nonstandard schedule work or nonstandard schedules' impact on interactions on various levels of household. So far, only a few studies (for example see Gornick & Meyers, 2003; Han, 2007; Presser, 2003) have pointed out or suggested (policy) implications for reducing or avoiding the

accumulation of negative consequences of nonstandard schedule work. Concrete strategies and mechanisms about how to deal with the (often disruptive) impact of nonstandard schedule on workers and families, or more precisely how to buffer or weaken this impact, are out of the scope also in current research. However, due to the intertwined nature of contextual factors with the actual impact of nonstandard schedule work on workers and families, the presence and practice of various strategies and mechanisms for dealing with the impact of nonstandard schedules has appeared in all four studies. As following will be summarized and discussed practices that throughout all the studies/chapters appeared – both discussed in the literature, pointed out by respondents, and found in the data – important and efficacious for buffering or neutralizing the negative impact of nonstandard schedule work on workers and families. It should be also said that some of these practices and strategies (for example counseling of medical workers or policemen who enter nonstandard schedules) are already in place and function as mandatory part of nonstandard schedule working time in the Netherlands. Some other practices and aspects, at the same time, are difficult to regulate or implement centrally (for example the utility of working nonstandard schedules for households, or the autonomy and flexibility in working nonstandard schedules), yet appear to be important for nonstandard schedule workers and families.

The central mechanism shaping the presence and impact of nonstandard schedule in households is the *country-specific institutional context*. More precisely, work time regulation and work-family policies. As argued throughout the thesis, it is often rather the culture, poor working conditions, unequal opportunities, and a lack of employment protection and not nonstandard schedules *per se* that may hurt couples' relationships and families. Moreover, similar mechanisms (such as working nonstandard schedules for child-care reasons) can have a different meaning and outcomes in different country context. Regarding the rather modest impact of work in nonstandard schedules in a society where work in these schedules is quite widespread, the Dutch case provides a rather positive example. Nonstandard schedule work in The Netherlands has no overwhelmingly negative connotations, nor a clear tendency to accumulate in already disadvantaged households. The key factor here is that being 'out

of the sync' with the standard individual and social rhythm creates in itself strong physical and social strains on the workers and families of nonstandard schedule work. A compensation and 'buffer'-mechanism helps to control or reduce the negative impact of nonstandard schedule work.

One of the central ways that shape the prevalence and meaning of nonstandard schedule work is *working time regulation*. This includes how many hours workers are allowed to work, how many hours can be worked in nonstandard times, what hours/days are nonstandard, whether and how work in the 'unhealthy' days and hours is compensated/rewarded. This is usually regulated at a higher level by national laws and/or collective agreements. In the Dutch case, rather strict regulations do not necessarily result in the low prevalence of these schedules. However, nonstandard schedule work is more limited and concentrated into occupations where these schedules are unavoidable and form integral part of these occupations (for example, nurses, midwives, policemen, factory workers, workers in agriculture). This, in turn, allows workers to perceive nonstandard schedule work to great extent as 'part of the deal' when opting for some of these occupations.

Even when being an integral part of many occupations, workers in these schedules are still exposed to the risk of negative consequences related to nonstandard schedule work. One of the most standard compensation mechanisms for being engaged in these schedules is *increased pay* for days and hours worked outside of 'standard' working times. This type of compensation mechanism, however, seems efficient only in the case when it helps workers to 'buy themselves out' of these hours, and does not attract them to get engaged in them even more intensively. In the first case, higher pay for working in nonstandard times such as night shifts is reflected in the reduced number of weekly working hours. The remuneration for work in nonstandard times allows the worker to work fewer hours for the same income. In the second case, extra pay attracts lower income workers to engage in even a higher number of nonstandard schedules in order to earn a decent income. An important regulatory mechanism is also working time restrictions. To protect workers against the unhealthy consequences, they are forced to work less hours once engaged in nonstandard times. Once work in nonstandard times becomes a way to earn decent income, there is a high risk for the marginalization of

nonstandard schedule work and respectively for another disadvantage to accumulate in households which are already in a more vulnerable position.

Next to extra pay, there can and do exist various *other compensation mechanisms*, such as additional recreational time/free days, which allows the workers to recover from especially the physical strain of working in the times that are usually meant for resting. Also, in order to prevent negative consequences, workers in nonstandard schedules need respective health check-ups and assistance. Counseling and advice on how to avoid the accumulation of negative (physical) consequences of nonstandard schedule work are also recommendable and useful.

Another important factor reducing the negative impact of nonstandard schedule work on workers lives are *autonomy and flexibility* of working time, a chance to choose/impact the starting and ending times or working times. Control over the timing of nonstandard schedule work significantly reduces the negative impact of these schedules on the workers. Of course, the chance for flexibility depends on the nature of the occupation. In some jobs, it is a considerable option whereas in others it is not. A considerable addition or alternative could be more focus on the *predictability of working times*. Knowing the working schedule a longer time in advance helps workers to plan the rest of their activities and again reduce the strain of nonstandard schedule work on their lives.

The negative consequences of nonstandard schedule work are also reduced when these schedules are worked *intentionally* or *voluntarily*. Here an important factor is the individual or household need for working these schedules. As discussed throughout all chapters, nonstandard schedules are often worked due to household reasons such as arranging child-care and in these cases there can be observed little or almost no negative impact of nonstandard schedule work on household relations. The latter is, however, again true only in a working time regulation context where there are sufficient compensation and buffer-mechanisms available against the negative consequences of work in nonstandard times. In other words, engaging in nonstandard schedules is considered as an efficient way to solve household needs. In order to avoid a negative impact, an important role is also here played by employers who should inform and educate their workers about the consequences and challenges related to engagement in nonstandard schedules, even when done so voluntarily. Next to that, it is

important to recognize why nonstandard schedule work is intentionally integrated into the lives of workers and families. For example, when households turn to nonstandard schedule work because this is a way to arrange child-care, it may indicate that the child-care facilities they need are missing or do not fulfill their expectations. Thus, there is a high risk that these schedules are worked due to forced need and not due to household preference, which may increase through the strain related to nonstandard schedule work negative consequences for the household. A rarely discussed issue is the reverse problem – many nonstandard schedule workers have children and they often need ‘nonstandard schedule’ child-care facilities. Lack of sufficient child-care facilities can here, in turn, create stress and challenges for households.

At the individual/household level various strategies exist that allow controlling or reducing the negative impact of work in these schedules. The latter is especially important in the country-context where institutional support when working nonstandard schedules is weak or absent. A key individual/household level factor is the *awareness of the potential negative impact*. It allows workers and families to prevent or react on time to the challenges created by nonstandard schedule work. For raising awareness, again employers or unions, but also employees themselves can contribute. It is also important to realize that nonstandard schedule work does not impact only the worker, but the entire household and their shared (free) time. What is very important is *communication* between the family members, planning of activities, and creating own routines and activities. The strategies that families are able to create and apply often depend on the general institutional frame, which shapes among others also the meaning of nonstandard schedule work.

To summarize, various ‘buffer’-mechanisms can be imposed or introduced on the institutional or employer-worker or individual level to reduce the negative impact of these schedules on workers. However, for individual-level strategies to be more efficient, higher (employer, state) level regulation mechanisms become crucial. Here the Dutch case represents a rather positive example. At the same time, it is also clear that the two country cases under examination – The Netherlands and the United States – represent historically different types of welfare regime and it is unlikely that work time regulation in both countries will resemble one

another very soon. However, even the rather successful Dutch case shows that workers and families of nonstandard schedule workers suffer negative consequences of this type of work. Therefore, it is not only the Americans who can or should learn from Dutch case, but also the other way round. In the backdrop of general shift towards higher de-regulation in The Netherlands, including working time, one should keep in mind the American experience where work in nonstandard schedules has become often a marginal employment practice, a characteristic of so-called 'bad jobs'. It is favorable if workers and households can choose to work in nonstandard schedules according to their needs and preferences. Once it becomes a forced choice, however, there is a higher risk for increasing inequality between standard and nonstandard schedule workers. In the latter case, there is a high risk that work in nonstandard times accumulates among the already disadvantaged societal groups who become heavily exposed to the negative consequences of nonstandard schedule work on family cohesion.

1.8. Appendix

A1.1. SPSS syntax for creating variables of nonstandard day/shift work

```
* Work schedules: days.
do repeat aaa = AS17MO AS17TU AS17WE  as17th as17fr as17sa
as17su
    /sss = AS17MOS AS17TUS AS17WES AS17THS AS17FRS
AS17SAS AS17SUS
    /fff = AS17MOF AS17TUF AS17WEF AS17THF AS17FRF
AS17SAF AS17SUF.
if ((aaa eq 1 or sysmiss(aaa)) and (sss ge 0 or fff ge 0))
aaa = 2.
if ((sysmiss(aaa)) and (sss ge 0 or fff ge 0)) aaa = 2.
end repeat.

COUNT wrk_days = AS17MO AS17TU AS17WE as17th as17fr as17sa
as17su (2).

do if (wrk_days ge 1).
count days_wend = as17sa as17su (2).
count days_week = AS17MO to as17fr (2).
end if.

if (days_week eq 5 and days_wend eq 0) sch_days = 1.
if (days_week lt 5 and days_wend eq 0) sch_days = 2.
if (days_week ge 1 and days_wend ge 1) sch_days = 4.
if (days_week eq 5 and days_wend eq 2) sch_days = 3.
if (days_week eq 0 and days_wend ge 1) sch_days = 5.

val lab sch_days 1 'wdays only, 5 days'
                 2 'wdays only, <5 days'
                 3 '7 days'
                 4 'wdays & wend, <7'
                 5 'wend only, 1-2 days'.

* Work schedules: hours/shifts.
do repeat hr=as17mos to as17suf
    /xxx=hr1 hr3 hr5 hr7 hr9 hr11 hr13 hr2 hr4 hr6 hr8 hr10
hr12 hr14.
compute xhr = trunc (hr/100).
compute xmin = (hr - xhr*100)/60.
compute xxx = xhr + xmin.
end repeat.

compute mo_wrk1 = hr2-hr1.
compute tu_wrk1 = hr4-hr3.
```



```

compute we_wrk1 = hr6-hr5.
compute th_wrk1 = hr8-hr7.
compute fr_wrk1 = hr10-hr9.
compute sa_wrk1 = hr12-hr11.
compute su_wrk1 = hr14-hr13.

count corr24 = hr1 to hr14 (13 thru hi).
do repeat wrk= mo_wrk1 to su_wrk1.
if (wrk lt 0 and corr24 ge 1) wrk = wrk + 24.
if (wrk lt 0 and corr24 eq 0) wrk = wrk + 12.
end repeat.

comp eee = 0.
do repeat hhh = hr1 hr3 hr5 hr7 hr9 hr11 hr13
    /www = mo_wrk1 to su_wrk1
    /wrk_nght = nght1 to nght7.
comp wrk_nght = 0.
comp eee = hhh + www.
if (hhh lt 8 and eee gt 8) wrk_nght = wrk_nght + 8-hhh.
if (hhh lt 8 and eee le 8) wrk_nght = wrk_nght + eee-hhh.
if (hhh lt 24 and eee ge 24 and eee le 32) wrk_nght =
wrk_nght + eee-24.
if (hhh lt 24 and eee ge 24 and eee gt 32) wrk_nght =
wrk_nght + 32-24.
end repeat.

do repeat hhh = hr1 hr3 hr5 hr7 hr9 hr11 hr13
    /www = mo_wrk1 to su_wrk1
    /wrk_day = day1 to day7.
comp wrk_day = 0.
comp eee= hhh + www.
if (hhh ge 8 and hhh lt 16 and eee ge 16 ) wrk_day =
wrk_day + 16-hhh.
if (hhh ge 8 and hhh lt 16 and eee lt 16 ) wrk_day =
wrk_day + eee-hhh.
if (hhh lt 8 and eee gt 8 and eee le 16) wrk_day = wrk_day
+ eee-8.
if (hhh lt 8 and eee gt 16) wrk_day = wrk_day + 8.
if (eee ge 32) wrk_day = wrk_day + eee - 32.
end repeat.

do repeat hhh = hr1 hr3 hr5 hr7 hr9 hr11 hr13
    /www = mo_wrk1 to su_wrk1
    /wrk_even = even1 to even7.
comp wrk_even = 0.
comp eee= hhh + www.
if (hhh le 16 and eee gt 16 and eee le 24) wrk_even =
wrk_even + eee-16.

```

```

if (hhh le 16 and eee gt 16 and eee gt 24) wrk_even =
wrk_even + 24-16.
if (hhh gt 16 and eee le 24) wrk_even = wrk_even + eee-hhh.
if (hhh gt 16 and eee gt 24) wrk_even = wrk_even + 24-hhh.
end repeat.

comp wrk_day = 7*mean(day1 to day7).
comp wrk_even = 7*mean (even1 to even7).
comp wrk_nght = 7*mean (nght1 to nght7).

format wrk_day (f4.2).
format wrk_even (f4.2).
format wrk_nght (f4.2).

compute total1 = wrk_day + wrk_nght + wrk_even.
compute total2 = sum(mo_wrk1 to su_wrk1).

do if (total1 gt 0).
compute prc_day = wrk_day/total1.
compute prc_even = wrk_even/total1.
compute prc_nght = wrk_nght/total1.
end if.

do if (total1 gt 0).
do repeat prc_ddd = prc_day1 to prc_day7
    /wrk = mo_wrk1 to su_wrk1
    /wrk_day = day1 to day7.
compute prc_ddd = wrk_day/wrk.
end repeat.

do repeat prc_eee = prc_even1 to prc_even7
    /wrk = mo_wrk1 to su_wrk1
    /wrk_even = even1 to even7.
compute prc_eee = wrk_even/wrk.
end repeat.

do repeat prc_nnn = prc_nght1 to prc_nght7
    /wrk = mo_wrk1 to su_wrk1
    /wrk_nght = nght1 to nght7.
compute prc_nnn = wrk_nght/wrk.
end repeat.
end if.

do if total1 gt 0.
do repeat prc_ddd = prc_day1 to prc_day7
    /prc_eee = prc_even1 to prc_even7
    /prc_nnn = prc_nght1 to prc_nght7
    /sss = sch1 to sch7.
compute sss = 5.

```

```

if (prc_ddd ge .50) sss = 1.
if (prc_eee ge .50) sss = 2.
if (prc_nnn ge .50) sss = 3.
if (prc_ddd eq 0 and prc_eee eq 0 and prc_nnn eq 0) sss =
0.
end repeat.
end if.

do if totall gt 0.
count day_total = sch1 to sch7 (1 2 3 5).
count day_part = sch1 to sch7 (1).
count even_part = sch1 to sch7 (2).
count nght_part = sch1 to sch7 (3).
end if.

compute day_prc = day_part/day_total.
compute even_prc = even_part/day_total.
compute nght_prc = nght_part/day_total.

do if totall gt 0.
compute sch_hrs = 5.
if (day_prc gt .5) sch_hrs = 1.
if (even_prc gt .5) sch_hrs = 2.
if (nght_prc gt .5) sch_hrs = 3.
end if.

recode sch_hrs (-1=sysmiss).
val lab sch_hrs 1 'fixed day'
                2 'fixed evening'
                3 'fixed night'
                5 'rest (hours vary)'.

```