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Jutta M. Joesch and
C. Katharina Spiess

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DIW Berlin

German Institute
for Economic Research

Königin-Luise-Str. 5
14195 Berlin,
Germany

Phone +49-30-897 89-0
Fax +49-30-897 89-200

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EUROPEAN MOTHERS' TIME WITH CHILDREN: DIFFERENCES AND SIMILARITIES ACROSS NINE COUNTRIES

Jutta M. Joesch
Battelle and University of Washington, Seattle, USA
joesch@battelle.org

C. Katharina Spiess
DIW Berlin and Technical University Berlin, Germany
kspiess@diw.de

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JEL Classification: D1, J2
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ABSTRACT

We use data from the 1996 wave of the European Community Household Panel to present and compare the weekly number of hours mothers of children less than 16 years of age reported looking after children in nine European countries in 1996. In addition, we explore to what extent cross-country differences in socio-demographic characteristics and parents' employment status contribute to differences in maternal time with children across the nine countries. We find cross-country differences in the mean of the amount of time mothers reported looking after children. Only a small portion of these differences is explained by differences in socio-demographic characteristics and employment status across countries in Europe. For three country pairs, we use a Oaxaca decomposition to investigate whether behaviour differences or differences in sample characteristics explain more of the observed differences in mothers' time looking after children. According to our results, the differences between Ireland and the UK can be explained mainly by behaviour differences. The results for Germany vs. Austria and Denmark vs. Greece, however, depend on the weights used.

European Mothers' Time With Children:
Differences and Similarities Across Nine Countries

Few studies have investigated how much time parents in Europe spend with their children. Fewer studies have investigated whether the amount of time differs from country to country. As more mothers have entered the labour force and more children are living with single parents, there is concern with how children are cared for. Time with parents is considered an investment in children and is thought to be crucial for children's cognitive and social-emotional development and educational outcomes. Indeed, some regard the time parents devote to children an important form of intergenerational transfer of wealth (e.g., Hill & Stafford 1985).

In this paper, we document and compare the number of hours per week mothers of children under 16 years of age reported looking after children in nine European countries in 1996.[1] Developing policies aimed at supporting families and/or women's employment will be aided by knowledge of the amount of maternal time spent looking after children. Additionally, understanding what socio-demographic factors and employment factors are related to the amount of time mothers spend with children is important. Finally, investigating differences in maternal time with children across countries is a step towards understanding the impact of policies aimed at supporting families and employment. Beyond addressing these issues, we also explore some of the reasons that may contribute to observing differences in maternal time with children in the nine countries, to the extent possible with the available data.

The data for the study are from the 1996 wave of the European Community Household Panel. The European Community Household Panel collects information from nationally representative samples of households in 14 European countries. We use data from 9 countries and from households in which all children were under 16 years at the time the survey was conducted. We find considerable differences across countries in the amount of time mothers spend with children. However, only a small amount of these differences is explained by cross-country differences in socio-demographic characteristics and employment status. Furthermore, our results show no clear picture with respect to whether cross-country

differences in time use can be attributed more to differences in the behavior of mothers or to the sample characteristics of the different countries.

Mothers' Time with Children

Most empirical investigations on the allocation of parental time to children have been conducted for countries other than those in Europe. Some recent examples include a study for Australia by Miller and Mulvey (2000), studies for Canada by Douthitt (1989) and Gauthier et al. (2001), and for the United States by Bryant and Zick (1996a/b), Bianchi (2000), and Sandberg and Hofferth (2001). For Europe, studies with a focus on time spent in domestic tasks are available for Finland (Kirjavainen & Barclay 1990), Sweden (Gustafsson & Kjulin 1994), Switzerland (Sousa-Poza, Schmid, Widmer 2001), and the United Kingdom (Jenkins & O'Leary 1995). The European studies are based on data gathered with a variety of instruments, at different points in time, and from samples with different compositions. The studies also use different definitions of domestic work, not all of which include the care of children. As such, these studies are not well suited to describe and compare how much time European mothers spend caring for children and to examine why the amount of time may differ from country to country. However, previous time-use studies provide useful information to guide our cross-country comparison.

The goal of our cross-country comparison is to gain insights into reasons for differences in maternal time spent looking after children. We conduct a multivariate analysis with correlates of time use that may differ across countries, to investigate to what extent these correlates explain cross-country differences. For instance, infants require more time than older children. Thus, if the age distribution of children varies from country to country, we would expect to observe differences in the average amount of time mothers in different countries spend looking after children.

Our selection of correlates of maternal time with children is guided by the neoclassical microeconomic model of the household (e.g., Becker 1981) and extant empirical time use studies. The microeconomic model of the household is premised on the notion that individuals attempt to generate well-being for themselves and their family by allocating

[1] We concentrate on mother's time with children, as in all European countries mothers are

limited financial and time resources in accordance with their preferences and available technology. In the specific focus of this study, mothers are thought to derive satisfaction from bringing up and enjoying well-adjusted children, from consuming market- and home-produced goods and services, and from non-work time. Realizing these goals requires mothers to make decisions about the amount of time spent caring for children, how much time to spend earning money, and what type and amount of goods and services to purchase or produce at home. Making these decisions involves trade-offs, since limited resources compete for alternative uses. According to this framework, how much time a mother spends with children depends on the price of her time, the prices of goods and services used, the determinants of technology, the family's financial resources, and the mother's preferences. We next present the correlates of mothers' time spent looking after children that are included in our multivariate analysis.

Correlates of time with children

Number and ages of children. How old her children are plays a central role in a mother's decision on how much time to spend with them. A small child greatly enhances the value of a mother's time spent at home by creating more opportunities for joint production and economies of size. As children grow up they become more goods- rather than time-intensive. This influences the trade-off between working at home and employment and reduces a woman's incentive to engage in paid work and find substitute care until her child is more independent (Bryant, 1990). In addition, most parents' preferences are such that they want to do what is best for their children. Children's physiological, cognitive and socio-emotional needs vary by age, and their changing needs influence the kind of care that is most appropriate. There is evidence that parents select different types of child care depending on the child's age (Blau, 1991; Leibowitz, Waite, & Witsberger, 1988; Ondrich & Spiess 1998; Veum & Gleason, 1991). For example, young children are more likely than older children to be cared for exclusively by their parents. Thus, we expect a negative relationship between the amount of time a mother spends looking after children and the age of her children, all else equal. Several earlier use studies have found that the amount of time parents spend on child care decreases as children become older (e.g., Douthitt 1989; Gustafsson & Kjulin 1994).

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still the ones who are mainly in charge of the education and care of children.

The more children in a family, the more opportunities there are for joint production and economies of size, enhancing the value of the mother's time spent at home. In addition, the more children, the more financial resources parents have to give up for substitute care. Thus, we expect a positive relationship between the number of children in a household and the amount of time the mother spends with children. This expected relationship has been reported in previous empirical time use studies on domestic work (e.g., Jenkins & O' Leary 1995; Miller & Mulvey 2000; Sousa-Poza, Schmid, & Widmer 2001).

Several factors address the availability of substitutes for the mother's time: the number of adults in the household other than the partner, the mother's marital status, and her partner's employment status. By considering the father's employment status as a correlate of mothers' time use, we follow the literature in assuming that the father's employment decision is exogenous to the mother's child care and employment decisions (e.g., Blau & Hagy 1998; Michalopoulos & Robins 2000; Michalopoulos, et al. 1992). This assumption may be inappropriate for some households. Empirical evidence from the U.S. suggests that it was adequate in national data (Mroz 1987), at least in the past.

Adult family members. Adults who share a household with a family are a potential source of inexpensive child care. At the same time, not every adult is a qualified provider in the eyes of the parents, or are available as a caregiver. Women tend to be called upon more for child care duties than men, but many women are now in the labor force, and thus not available. While grandparents may be less likely to have employment responsibilities, they may have other restrictions that limit their ability to help with child care, such as health problems.

Mother's marital status. Single mothers do not have a partner with whom to share household tasks. One, might, therefore, expect single mothers to have less time for their children, than otherwise similar mothers who live with a partner. There is some evidence of a negative relationship between being a single parent and the amount of domestic work time. However, estimates of the relationship between being a single parent and the amount of time spent caring for children are mixed. The relationship is not statistically significantly different from zero in some studies (Miller & Mulvey 2000; Sousa-Poza et al. 2001), and negative in another (Sandberg & Hofferth 2001). According to Gauthier at al. (2001), single mothers who have at

least one child under five spent more time with children than married, employed mothers, but less time than married, non-employed mothers.

Father's employment status. When an employed father lives in the household, he obviously has less time available to take care of children, or share other domestic tasks, than when he is not employed. Gustafsson & Kjulin (1994) report that women whose husband works do spend more time in child care, ceteris paribus.

Mother's education level. The mother's education level may affect time use through its impact on productivity in generating home produced goods and services, lifestyle preferences, and attitudes and values. Parents with different educational backgrounds may also bring different aspirations to child rearing. In some past time use studies, more highly educated mothers have been found to spend more time with their children (e.g., Hill & Stafford 1985; Leibowitz 1974; Sandberg & Hofferth 2001), holding other factors constant.

Mother's age. Older mothers' preferences towards time with children may differ from those of younger mothers, due to differences in values and knowledge influenced by different and additional life experiences. In addition, more experience with household tasks is likely to increase household productivity, which may, in turn, influence the amount of time spent looking after children, ceteris paribus. The evidence on the relationship between the mother's age and time with children is mixed. According to at least one study, there is a negative relationship between the mother's age and time spent with children (Gustafsson & Kjulin 1994). Others find an inverted U-shaped pattern that indicates that younger and older women allocate less time to child care than women between 25 and 34 years of age (Miller & Mulvey 2000). Yet others do not find a relationship that differs from zero (Sousa-Poza et al. 2001). All three studies referenced above took into account the ages of children who live in the household. Thus, the mixed findings are unlikely the result of a life cycle effect.

Mother is "foreign". There are cultural differences in attitudes towards child rearing. Thus, mothers who are not native to the country in which they reside may have different attitudes than native mothers towards spending time with children. In the case of Switzerland, Sousa-Posa et al. (2001) find that foreign women tend to spend more time on housework than Swiss

women. However, for time spent caring for children, their estimate that distinguishes foreign and Swiss mothers is not statistically significantly different from zero.

Family financial resources. A family's financial resources can come from a variety of sources. We distinguish mother's earnings and family income other than the mother's. Additional income increases the demand for a good, if the good is desirable, and decreases it otherwise, all else constant. If a mother considers caring for children herself more appropriate and/or desirable, we would expect her to spend more time with children, the more financial resources her family has, ceteris paribus.

In addition to taking into account family income other than the mother's, we include the mother's earnings in our empirical model. Since we are also controlling for the mother's employment status, the mother's earnings reflect an income effect, rather than a substitution and an income effect. As in the case of family income other than the mother's, a mother who earns more money than an otherwise comparable mother has more opportunity to spend time with children. She may, for example, opt to free up the time she spends with household chores by getting help cleaning the house or relying on other time-saving devices.

Household technology. Housework-related technology provides mothers with the opportunity to free up their time from household chores and have it available to spend with their children, instead. However, according to Gustafsson and Kjulin's results for Sweden (1994), owning a dishwasher was not statistically significantly related to the amount of time mothers spent caring for children, and having a kitchen machine had a negative effect.

Mother's employment status. Given the concern and interest in the impact of mothers' employment on time spent looking after children, we include measures of the mother's employment status in our empirical analysis. Given the limited amount of time available in a day, otherwise comparable mothers who are employed, have less time to devote to the care of their children than mothers who do not work for pay. Self-employment can offer more flexibility with respect to arranging one's schedule. A mother who is self-employed may, for example, choose to do some of her work while her children sleep, to have more time with them during the day, than a mother who works a standard schedule, everything else the same.

Nevertheless, even a self-employed mother has fewer hours in the day available to care for her children than a mother who is not employed.

Not surprisingly, employment status is, indeed, a significant determinant of child care time in, for instance, Douthitt's (1989) study of Canadian data, Kirjavainen and Barclay's (1994) comparison of Finish and U.S. households, Bryant and Zick's (1996a) study of historical trends in the time spent caring for children in the U.S., and Sandberg and Hofferth's (2001) analysis of changes in children's time with parents in the U.S. between 1981 and 1997. At the same time, Gershuny and Robinson (1988) report for the U.S., that although employed mothers spend less time in child care than non-employed mothers, between the 1960s and 1980s there has been an increase in the amount of time employed mothers spend with their children. Bryant and Zick (1996a) also conclude that, even after taking into account mothers' increased attachment to the work force, U.S. mothers in two-parent families spent more time on child care per child by the early 1980s than in the mid-1920s.

The economic model sketched above suggests that how much time a mother spends in market work and how much time she spends looking after her children is simultaneously determined. Thus, if time with children is estimated as a function of the mother's actual employment status, the estimates may be biased and inconsistent due to simultaneous equations bias. To avoid this possibility, we use a predicted measure of the mother's employment status. We describe its construction in the section on measures, below.

Data and Methods

Analysis Sample

Our analysis is based on data from the European Community Household Panel (ECHP). The ECHP is a large-scale survey organized and funded by the European Union.[2] The purpose of the ECHP is to gather individual-level information that is comparable across European countries. Topics of interest include: employment and unemployment experiences, earnings, household wealth, household expenditures, and household living conditions. The first wave of ECHP data was collected in 1994 in twelve countries of the European Union. Additional waves covering up to 15 countries were conducted annually in subsequent years. The most

current wave of data available at the time we begun our analysis was collected in 1996. In 1996, the following countries participated in the survey: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, and the United Kingdom.

The ECHP data offer several advantages for our analysis. One, in each country, the ECHP sample is nationally representative of the same population of interest, namely, all private households in the national territory. Two, the country-specific samples are relatively large. The number of households participating in the 1996 survey range from 933 in Luxembourg to 7,132 in Italy. Three, information on time spent looking after children is collected from all mothers, rather than a subset of mothers, such as employed women. Finally, and most importantly, it was intended to conduct the interviews with standardized questionnaires to make the data directly comparable across the participating countries.

For the analysis sample, we selected households in which all children were under 16 years at the time the survey was conducted. From the remaining sample we excluded a small number of cases (less than five per country) in which more than one mother or more than one father resided in the household, to avoid a potential ambiguity in how parents and children in the household are related.

In a few countries, a considerable portion of mothers reported not spending any time with children under 16 years of age as part of their normal activities. These countries are Belgium, Finland, France, and Portugal.[3] The ECHP is not the first European survey to find such a result. Sousa-Poza, Schmid, and Widmer (2001) report that 14% of females with children under the age of 14 did not spend any time on child care according to the 1997 Swiss Labour Force Survey. And Gustafsson and Kjulin (1994) note that more than 50% of the households

[2] For further details see EUROSTAT (1996a,b), Clémenceau and Verma (1996), Wirtz and Mejer (2002), http://forum.europa.eu.int/Public/irc/dsis/echpanel/library

[3] In Italy, the variable on time spent looking after children was top-coded at 70 hours per week. As this top-coding impacts the mean time spent looking after children, we also excluded Italy from the analysis.

in their Swedish sample have a value of zero for time spent on child care.[4] While it is possible that some mothers spend very little time with their children, especially when the children are older, we were, nevertheless, concerned about the relatively large percentage of women in these countries who reported not spending any time looking after children. Further investigation revealed that, despite intentions to the contrary, the ECHP time-use questions were not equivalent in all countries. We therefore excluded from the analysis the four countries for which the survey questions on time spent looking after children were not comparable.

Missing data reduced the sample usable for analysis; 175 cases had incomplete information on the amount of time spent looking after children, and 68 observations had missing data on income. Our final analysis sample consists of 7,445 cases.

Measures

Measures of the amount of time spent looking after children

Information on time use is typically collected in one of three ways: with time sampling, with time diaries, or with retrospective survey questions. In time sampling, study participants are asked to record the activities they are engaged in when a beeper or similar device goes off. While time sampling provides valid information on how individuals spend their time, the data collection approach is costly and intrusive. In the case of diaries, study participants are asked to record in detail in time diaries that cover 24-hour time periods how they spend their day, including activities that may take as little as five minutes. Diaries have been shown to provide valid and reliable information on time use (Gershuny & Robinson 1988; Juster & Stafford 1991). However, cost considerations have limited the use of time diaries for data collection. Retrospective survey questions are the most common method of collecting time use information. In this approach respondents are asked to recall how much time they spent during a particular time period in certain activities. Unfortunately, in some cases this approach has been shown to generate inaccurate time use information (Juster & Stafford 1991).

[4] However, it is not clear from Gustafsson and Kjulin's manuscript whether the percentage is this large for households with at least one child under the age of twelve years.

The ECHP collected information on time spent looking after children through retrospective survey questions. Each household member 16 years of age and older was asked whether their normal daily activities, apart from any job or business, includes looking after children without pay, and the weekly amount of time spent in this activity. The questions did not distinguish between the physical and non-physical care of children or between direct care or adult-child shared time. Adult-child shared time refers to activities other than the direct care of children, such as children helping parents with household tasks. In addition, the ECHP survey did not collect information on the amount of time each adult spent looking after each child in the household, but rather on the total amount of time each adult spent caring for children per week. Thus, the measure of mothers' time with children in the ECHP is not optimal, as far as time use researchers are concerned. On the other hand, the ECHP is the only data source with comparable time use information for several European countries based on nationally representative samples. Since our focus is on a cross-country comparison of mothers' time with children, it should be possible to explore differences across countries, as long as the survey questions regarding time-use are comparable across countries.

Measures of correlates of time spent looking after children

As noted, in addition to describing how much time mothers in nine European countries spend looking after their children, we explore some possible reasons for observing differences. We begin this exploration by comparing the average amount of time mothers in different countries spent looking after children, after controlling for cross-country differences in socio-demographic factors. To the extent that socio-demographic population characteristics differ from country to country, these characteristics contribute to observing differences in maternal time use in the nine countries considered here. For instance, how many preschoolers a family has, can have a considerable influence on the amount of time a mother spends caring for children. The factors capture constraints, heterogeneous preferences, and technology that can differ from country to country, but they should not reflect the influence of family policies on time use decisions. The corresponding variables are summarized in Table 1. Descriptive statistics can be found in Table 2.

Table 1. Definition of Variables

Variable	Definition
DEPENDENT VARIABLE	
Mother's Time with Children	hours/week mother spent looking after children without pay, as part of her normal, daily activities apart from any job or business
COVARIATES	
Mother	
Age	
17-24 years	1 if mother is between 17 and 24 years old, 0 otherwise
25-29 years	1 if mother is between 17 and 24 years old, 0 otherwise
30-34 years	omitted reference category for mother's age
35-39 years	1 if mother is between 35 and 39 years old, 0 otherwise
40-44 years	1 if mother is between 40 and 44 years old, 0 otherwise
45-67 years	1 if mother is between 45 and 67 years old, 0 otherwise
Education	
Low	omitted reference category for mother's education
Medium	1 if mother has completed secondary education (ISCED 3) that began when she was 14-15 years old and that lasted about 3 years, 0 otherwise
High	if mother has completed secondary education (ISCED 5-7) that began when she was 17-18 years old, and either (1) lasted at least 3 years and lead to university or postgraduate degree; or (2) lasted about 4 years and lead to an award not equivalent to first university degree
Employment Status (Estimated)	
Not in labour force	omitted reference category for mother's employment status
Employed part-time	1 if mother works 29 hours/week or less, 0 otherwise
Employed full-time	1 if mother works 30 or more hours/week, 0 otherwise
Self-employed	1 if mother is self-employed, 0 otherwise
Foreign	1 if mother's nationality differs from the country of residence, 0 otherwise
Single Parent	1 if mother does not live with a partner, 0 otherwise

Table 1. Definition of Variables

Variable	Definition
Father	
Employment Status	
Employment status	1 if father is employed, 0 otherwise
Employment missing	1 if information about father's employment status is missing, 0 otherwise
Self-employed	1 if father is self-employed, 0 otherwise
Household Characteristics	
Youngest Child	
< 1 years	1 if youngest child in household is less than 1 year old, 0 otherwise
1-2 years	1 if youngest child is between 1 & less than 3 years old, 0 otherwise
3-5 years	1 if youngest child is between 3 & less than 6 years old, 0 otherwise
6-12 years	1 if youngest child is between 6 & less than 13 years old, 0 otherwise
13-15 years	omitted reference category for youngest child's age
Number of children	
Beyond 1 child	0 if HH has 1 child, number of children minus 1 otherwise
Beyond 2 children	0 if HH has 1 or 2 children, number of children minus 2 otherwise
Household Size	No. of persons 18 years of age or older who live in the household
Income	
Work Income	Yearly household income from work, net of mother's earned income
Non-work Income	Yearly household income from sources other than employment
Dishwasher	1 if household has dishwasher, 0 otherwise

Specifically, we control for the number and ages of children in the household, the number of adults who live in the household, the mother's marital status, the father's employment status, the mother's education level and age, whether the mother is "foreign", and whether the household has a dishwasher.

Table 2. Descriptive Statistics by Country

Variable	A	D	DK	E	G	IRL	L	NL	UK
Time with Children	54.87 (28.6)	50.98 (25.0)	45.87 (29.8)	53.01 (27.3)	37.09 (18.8)	66.85 (26.9)	44.38 (24.6)	57.71 (24.9)	73.03 (25.7)
Mother									
Age									
- 17 to 24 years	0.06 (0.23)	0.03 (0.16)	0.03 (0.21)	0.05 (0.21)	0.09 (0.28)	0.67 (0.25)	0.02 (0.14)	0.01 (0.12)	0.44 (0.21)
- 25 to 29 years	0.18 (0.38)	0.12 (0.33)	0.15 (0.36)	0.15 (0.36)	0.20 (0.40)	0.14 (0.35)	0.15 (0.37)	0.11 (0.31)	0.18 (0.38)
- 30 to 34 years	0.37 (0.48)	0.13 (0.46)	0.33 (0.47)	0.33 (0.47)	0.31 (0.46)	0.26 (0.44)	0.29 (0.46)	0.27 (0.45)	0.33 (0.47)
- 35 to 39 years	0.25 (0.43)	0.33 (0.47)	0.29 (0.45)	0.31 (0.46)	0.24 (0.43)	0.33 (0.47)	0.29 (0.46)	0.37 (0.48)	0.27 (0.45)
- 40 to 44 years	0.11 (0.32)	0.15 (0.36)	0.12(0.33)	0.12 (0.32)	0.10 (0.31)	0.13 (0.34)	0.20 (0.40)	0.19 (0.39)	0.13 (0.33)
- 45 to 67 years	0.04 (0.20)	0.05 (0.22)	0.07(0.25)	0.05 (0.21)	0.07 (0.25)	0.07 (0.26)	0.02 (0.15)	0.48 (0.21)	0.05 (0.22)
Education									
- Medium	0.68 (0.47)	0.58 (0.49)	0.40 (0.49)	0.21 (0.41)	0.34 (0.47)	0.48 (0.50)	0.33 (0.47)	0.59 (0.49)	0.41 (0.49)
- High	0.09 (0.30)	0.17 (0.38)	0.41 (0.49)	0.21 (0.41)	0.28 (0.45)	0.14 (0.35)	0.14 (0.35)	0.19 (0.39)	0.21 (0.41)
Employment									0.32 (0.47)
- Part-time	0.24 (0.43)	0.31 (0.46)	0.11 (0.32)	0.08 (0.26)	0.08 (0.27)	0.21 (0.41)	0.28 (0.46)	0.49 (0.50)	0.26 (0.44)
- Full-time	0.42 (0.49)	0.29 (0.45)	0.66 (0.47)	0.28 (0.45)	0.36 (0.48)	0.29 (0.45)	0.29 (0.35)	0.10 (0.30)	0.07 (0.25)
- Self-employed	0.10 (0.30)	0.03 (0.17)	0.03 (0.16)	0.05 (0.22)	0.08 (0.27)	0.03 (0.17)	0.04 (0.20)	0.04 (0.21)	
Foreign	0.05 (0.22)	0.04 (0.20)	0.04 (0.19)	0.01 (0.10)	0.02 (0.13)	0.02 (0.12)	0.39 (0.49)	0.02 (0.13)	0.03 (0.17)
Single Parent	0.10 (0.30)	0.10 (0.31)	0.11 (0.32)	0.03 (0.17)	0.03 (0.16)	0.06 (0.23)	0.07 (0.26)	0.06 (0.24)	0.18 (0.38)
Father									
Employment									

Table 2. Descriptive Statistics by Country

Variable	A	D	DK	E	G	IRL	L	NL	UK
- Employed	0.81 (0.39)	0.81 (0.39)	0.78 (0.41)	0.80 (0.40)	0.88 (0.32)	0.75 (0.43)	0.86 (0.35)	0.86 (0.35)	0.71 (0.45)
- Self-employed	0.12 (0.32)	0.08 (0.27)	0.06 (0.24)	0.17 (0.38)	0.37 (0.48)	0.20 (0.40)	0.09 (0.28)	0.07 (0.25)	0.14 (0.34)
Household									
Youngest Child									
- < 1 year	0.07 (0.26)	0.34 (0.18)	0.04 (0.20)	0.08 (0.27)	0.11 (0.31)	0.11 (0.31)	0.08 (0.23)	0.04 (0.20)	0.10 (0.30)
- 1 to 2 years	0.20 (0.40)	0.12 (0.34)	0.28 (0.45)	0.21 (0.41)	0.17 (0.38)	0.27 (0.44)	0.19 (0.40)	0.24 (0.43)	0.20 (0.40)
- 3 to 5 years	0.24 (0.43)	0.26 (0.44)	0.27 (0.45)	0.27 (0.44)	0.24 (0.43)	0.29 (0.46)	0.30 (0.46)	0.24 (0.42)	0.27 (0.44)
- 6 to 12 years	0.40 (0.50)	0.48 (0.50)	0.32 (0.47)	0.38 (0.49)	0.39 (0.49)	0.28 (0.45)	0.39 (0.49)	0.43 (0.50)	0.39 (0.49)
No. of Children									
- Beyond 1 child	0.82 (0.80)	0.79 (0.85)	0.76 (0.77)	0.68 (0.66)	0.76 (0.67)	1.26 (1.08)	0.83 (0.75)	0.98 (0.79)	0.93 (0.85)
- Beyond 2 children	0.20 (0.50)	0.20 (0.56)	0.17 (0.46)	0.10 (0.33)	0.11 (0.37)	0.53 (0.83)	0.20 (0.43)	0.25 (0.54)	0.26 (0.57)
Household Size	0.31 (0.82)	0.03 (0.21)	0.01 (0.12)	0.27 (0.78)	0.35 (0.74)	0.17 (0.60)	0.13 (0.42)	0.00 (0.10)	0.04 (0.25
Income (1,000 Euro)									
- Work income	18.42 (13.52)	20.31 (15.93)	17.87 (12.15)	10.81 (8.51)	10.02 (6.55)	14.21 (17.36)	27.46 (17.46)	18.63 (16.93)	13.42 (13.16)
- Non-work income	1.00 (3.70)	1.03 (3.64)	12.10 (8.78)	0.36 (2.27)	0.65 (1.77)	0.24 (1.60)	0.92 (2.69)	0.35 (1.86)	0.56 (2.42)
Dishwasher	0.68 (0.47)	0.64 (0.48)	0.60 (0.49)	0.21 (0.41)	0.33 (0.47)	0.35 (0.48)	0.73 (0.45)	0.39 (0.49)	0.31 (0.46)
Sample Size	689	829	583	1,331	1,098	764	207	1,103	841

Source: ECHP 1996, authors` calculations.

We represent the number and ages of children who live in the household with several variables, to allow for joint production and economies of size, as well as for differences in care intensity by the child's age. The variables measure whether the youngest child is less than 1 year, between 1 and 3, 4 and 6, or 6 and 12 years old, 1 minus the number of children in a family beyond 1 child, and 2 minus the number of children in a family beyond 2 children. The latter two measures address economies of size with splines. With this specification it is possible, for instance, that a second child in the family has a different effect on mothers' time spent looking after children than a third child. The mother's marital status is measured with a dummy variable that indicates whether she is a single parent. Whether the mother's time with children is related to having adults living with the family is addressed with a variable of the number of adults other than the parents who live in the household. We account for the mother's education level with two dummy variables: whether the mother has a "high" education level and whether the mother has a "medium" education level. The measures of education available in the ECHP are based on the categories developed by ISCED (the International Standard Classification of Education).[5] We measure the mother's age with 6 dummy variables that cover the age groups 17-24, 25-29, 35-39, 40-44 and 45-67 years of age (the age group 30-34 years of age is the reference category). Whether the mother is "foreign" is represented with a dummy variable. The dummy variable reflects whether the mother's nationality differs from the country in which she resides. Similar to Gustafsson and Kjulin (1994), we measure household technology with a dummy variable that indicates whether the household has a dishwasher. Family financial resources are measured with (1) yearly household income from work net of mother's, and (2) yearly non-work household income. Both figures are expressed in Euro. In addition, we incorporate self-employment into the empirical model with a dummy variable. The father's employment status is measured with three dummy variables. They address whether the father is employed, whether he is self-employed, and whether information about his employment status is missing.

After presenting information on the average amount of time mothers spent looking after children in the nine countries controlling for differences in socio-demographic factors across countries, we expand the multivariate model with measures of the mother's employment status. Mothers' employment decisions are influenced by policies related to parental leave

[5] See http://www.uis.unesco.org/en/act/act_p/isced.html

regulations, the tax treatment of the "wife's" earnings, the availability and price of child care, children's school schedules (e.g., Gornick 1997), to name a few. In our analysis, we are not able to disentangle these effects. However, we include in the multivariate model measures of the mother's earnings and her employment status. To address the possibility of simultaneous equations bias arising from a simultaneous determination of time spent in market work and time spent looking after children, we use a predicted value of the mother's employment status. Specifically, we estimate a multi-nomial logit model of whether a mother is not employed, employed part-time, or employed full-time (multinomial results can be found in Table A-1 in the Appendix). We then predict for each mother in the sample her probability of being in each of the three employment states, and use the predicted probabilities to generate dummy variables of whether a mother works part-time or full-time.[6]

Estimation

As noted, we excluded from the analysis data from five countries for which the survey questions regarding time spent looking after children or the coding are not comparable. In the remaining nine countries that participate in the ECHP, a small number of mothers reported not spending any time with children. In addition, time spent looking after children was top-coded at 96 hours per week. As a result, the outcome measure for the multivariate analysis is a limited-dependent variable. Consistent with prior analyses of time use (e.g., Gustafsson & Kjulin 1994; Sousa-Poza, Schmid, & Widmer 2001), we estimated Tobit models of mothers' time looking after children. We estimated a separate model for each country to allow for the possibility that parameter estimates vary across countries.

[6] To do so, we first take the predicted probabilities for the three employment states and turn them into a cumulative distribution. The cumulative distribution is generated by assigning a cumulative value to each employment state (event). The cumulative value for a particular event is the sum of the previous probabilities plus the probability of the event of interest. For instance, if the probabilities of three events are 0.3, 0.5, and 0.2, respectively, then the cumulative values are 0.3, 0.8, 1.0. We determine the value of the employment dummy variables by first choosing a random number from a random variable distributed uniformly over the interval 0-1, and then assigning the event that has the smallest cumulative value that is larger than the random number. To continue the above example, given a random number between 0 and 1 of, say, 0.734, we would assign the second event, since its cumulative value is 0.8 (the smallest one larger than 0.734).

We utilize two approaches to compare the amount of time European mothers spent looking after children: (1) by predicting time use for a "synthetic" European sample of mothers, and (2) by applying a Oaxaca-type decomposition.

We use predicted means derived from the synthetic European sample to compare mothers' time spent looking after children across countries, controlling for differences in socio-demographic and employment characteristics. The predicted means represent the average amount of time mothers in country *i* would spend looking after children, if they had "European" socio-demographic and employment characteristics. To predict the time use for the synthetic European sample, we first combined country-specific ECHP data to create a "synthetic" European sample. To give each country the same weight, we randomly selected two hundred households from each of the 14 countries for this synthetic European sample.[7] In the next step, we predicted for each country, based on that country's specific multivariate results, time spent looking after children for all mothers in the synthetic European sample.

The focus of Oaxaca decompositions is to decompose differences between two populations into (1) the part that is explained by the populations' differences in characteristics (observed Xs), (2) the part that is due to the same characteristics having a different effect depending on which population the person belongs to, and (3) the part that is due to a residual or noise. We follow the procedure described in Barmby and Smith (2001) to decompose the difference in hours looking after children between country *i* and country *j*. In particular:

(1) $Y_{Ci} - Y_{Cj} = [Y(ß_{Ci}; X_{Ci}) - Y(ß_{Ci}; X_{Cj})] + [Y(ß_{Ci}; X_{Cj}) - Y(ß_{Cj}; X_{Cj})]$

where:

Y_{ci} = mean time spent looking after children in country *i*

Y_{cj} = mean time spent looking after children in country *j*

$Y(ß_{Ci}; X_{ci})$ = mean estimated time spent looking after children based on country *i* coefficients and sample

$Y(ß_{Ci}; X_{cj})$ = mean estimated time spent looking after children based on country *i* coefficients and country *j* sample

$Y(ß_{Cj}; X_{cj})$ = mean estimated time spent looking after children based on country *j* coefficients and sample

[7] Sweden was not part of the 1996 survey, which leaves us with a total of 14 countries.

The first term on the right hand side of equation (1) represents the difference in hours due to differences in characteristics between the samples of country *i* and *j*. The second term represents the difference in hours due to the same characteristics having a different effect. Barmby and Smith (2001) interpret the second term as differences in preferences and behavior across countries.

With nine countries, a pairwise comparison for all countries would produce an overwhelming number of results. Instead, we focused the decomposition on three country pairs: (1) U.K. versus Ireland, (2) Germany versus Austria, and (3) Denmark versus Greece. We chose the first two country pairs to ensure identical question wording, but to capture different "cultures". We chose the third pair because the two countries are the most different among the European countries with respect to: female labor force participation rates, policies supporting the employment of mothers, child care for preschoolers and school-age children, and availability of informal care (see for example Bertelsmann Stiftung 2002; OECD 2001). We present and discuss the results from the comparisons after providing descriptive statistics on mothers' time spent looking after children.

Results

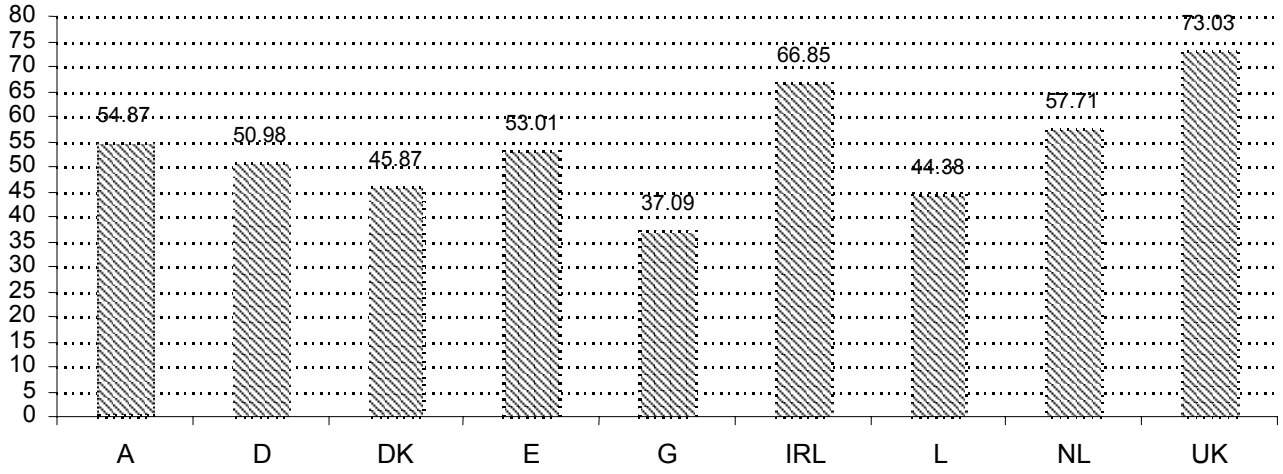
Amount of time mothers spent looking after children

Figure 1 shows the average amount of time per week mothers in nine European countries reported looking after children in 1996. The means across the nine countries range from a minimum of 37 hours per week to a maximum of 73 hours a week. This is a considerable difference, even when one considers that these figures do not take into account differences in the number of children across countries, or how old the children are, two factors that are central to the amount of time spent looking after children.

With respect to estimates of specific coefficients, not surprisingly, the ones for the age of the youngest child have the largest absolute values. The coefficients are consistently significantly different from zero and positive. In addition, the younger the youngest child, the larger the estimated coefficient. With few exceptions, the estimates for the mother's employment status are negative, but more estimates are not significantly different from zero.

Source: ECHP 1996, authors` calculations.

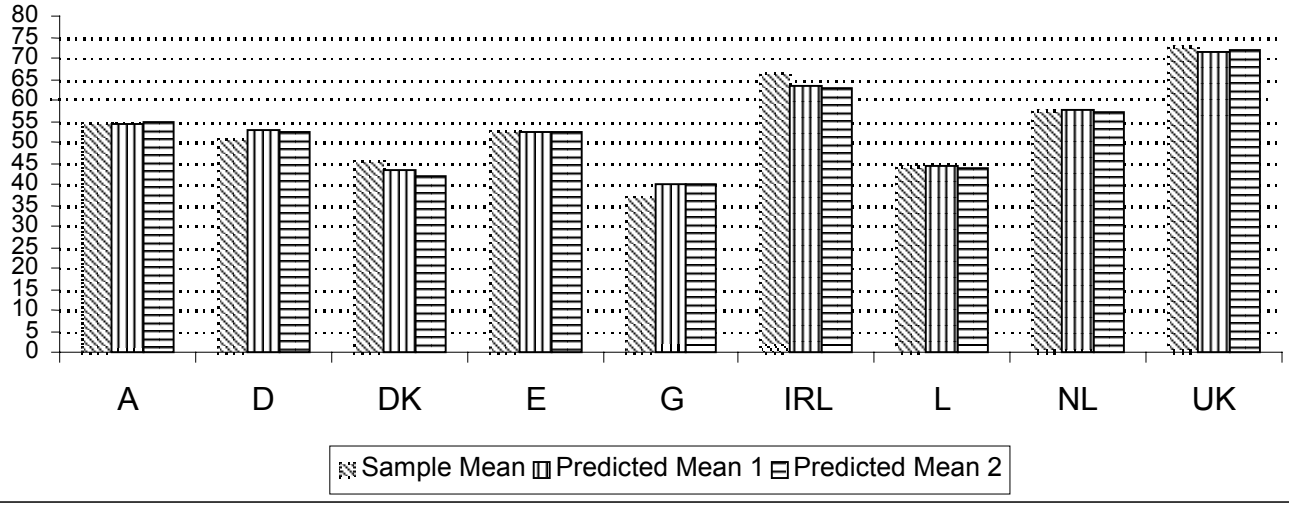
Figure 1.
Mothers' Time with Children in 1996:
Sample Means from 9 European Countries



Source: ECHP 1996, authors` calculations.

The estimates for household income net of the mother's are positive for six of the nine countries, but only two of these estimates are significantly different from zero. For two of the nine countries there is a significant estimate for single parent status: one of the estimates is positive and the other negative. The coefficient estimates for the remaining variables tend not to be statistically significantly different from zero. An example of coefficient estimates for one country is provided in the Appendix, Table A-2.

Figure 2.
Mothers' Time with Children in 1996:
Sample and Predicted Means from 9 European Countries



Source: ECHP 1996, authors` calculations.

Cross-country comparison of time spent looking after children: synthetic European sample

Figure 2 displays the same sample means together with two predicted means. Predicted mean 1 represents the average amount of time mothers in each country would have spent looking after children in 1996, had they had the socio-demographic characteristics of a representative sample of European mothers. The second predicted mean includes the additional effects of mothers' employment status. The three sets of means for each country are also reported in Table 3.

Several results of interest emerge from a comparison of the sample and estimated mean values. One, the first predicted means do differ from the sample means, that is, controlling for socio-demographic characteristics makes a difference. The differences range from less than one minute per week to over 3.5 hours per week. For instance, if mothers in Ireland had socio-demographic characteristics representative of mothers across Europe, on average, they would spend an estimated 3.5 fewer hours per week with children, than the actual mothers who lived in Ireland in 1996.

Two, adjusting for mothers' employment status changes the differences across countries somewhat. To continue the earlier example of Ireland, the gap in the difference in time spent looking after children by mothers in Ireland and mothers with European socio-demographic characteristics in Ireland increases to an estimated 3.9 hours after mothers' employment characteristics are considered. In contrast, the time gap decreases for mothers in the U.K. from 1.8 to 1.2 hours per week compared to U.K. mothers with European characteristics.

Table 3. Hours/Week Mothers Spent Looking After Children in 1996:

Sample and Predicted Means for 9 European Countries

	A	D	DK	E	G	IRL	L	NL	UK
Sample Mean	54.87	50.98	45.87	53.01	37.09	66.85	44.38	57.71	73.03
	(28.56)	(25.00)	(29.82)	(27.28)	(18.77)	(26.88)	(24.60)	(24.93)	(25.65)
Predicted Mean 1	54.31	52.73	43.17	52.42	39.85	63.31	44.06	57.73	71.24
	(14.63)	(12.91)	(18.19)	(14.03)	(7.93)	(13.88)	(16.87)	(12.84)	(12.19)
Predicted Mean 2	54.55	52.46	42.10	52.54	40.09	62.95	44.00	56.96	71.82
	(14.67)	(13.07)	(18.50)	(14.69)	(8.17)	(14.11)	(17.10)	(13.42)	(12.50)

Standard deviation in parentheses.

Predicted Mean 1 represents the amount of time mothers in each country would have spent looking after children in 1996, if they had had the socio-demographic characteristics of a representative sample of European mothers.

Predicted Mean 2 represents the amount of time mothers in each country would have spent looking after children in 1996, if they had had the socio-demographic and employment characteristics of a representative sample of European mothers.

Source: ECHP 1996, authors` calculations.

Table 4. Predicted Hours /Week Mothers Spent Looking After Children in 1996: Select European Countries

Mean predicted hours/week		Sample Country *i*		Sample Country *j*	
Country i	*Country j*	*ß Country i*	*ß Country j*	*ß Country i*	*ß Country j*
Ireland	U.K.	67.9	76.2	67.9	74.3
Austria	Germany	53.6	53.4	52.9	51.4
Denmark	Greece	46.1	40.8	39.3	37.0

Source: ECHP 1996, authors` calculations.

Cross-country comparison of time spent looking after children: Oaxaca decomposition

Table 4 shows mean predicted hours per week mothers spent looking after children for the six European countries we chose for our decomposition analysis. Tables 5A/B present the decomposition of the predicted mean time differences into a "sample characteristic" component and a "behavior" component for the three country pairs. This decomposition requires choosing estimated coefficients from either country in the pair to calculate the components. Since this choice is arbitrary, we present the results for both possibilities.

Table 5A. Decomposition of Differences in Mothers' Time Spent Looking After Children: Select European Countries

Country *i* vs. *j*	Predicted Difference	Characteristic Component	Coefficient Component
Ireland vs. U.K.	-6.4	0.0	-6.4
Austria vs. Germany	2.2	0.7	1.5
Denmark vs. Greece	9.1	6.8	2.3

For the above decomposition into Characteristic and Coefficient Component, the predicted coefficients from the first country in each pair are used as weights.

Source: ECHP 1996, authors` calculations.

Table 5B. Decomposition of Differences in Mothers' Time Spent Looking After Children: Select European Countries

Country *i* vs. *j*	Predicted Difference	Characteristic Component	Coefficient Component
Ireland vs. U.K.	-6.4	-1.9	8.3
Austria vs. Germany	2.2	-2.0	-0.2
Denmark vs. Greece	9.1	-3.8	-5.3

For the above decomposition into Characteristic and Coefficient Component, the predicted coefficients from the second country in each pair are used as weights.

Source: ECHP 1996, authors` calculations.

According to the estimates in Table 5A, for Ireland versus the U.K, and Denmark versus Greece, differences in sample characteristics explain less of the predicted mean difference in time spent looking after children than differences in behavior. The reverse is the case for Austria versus Germany. However, when the coefficients from the second country in each pair are used as weights for the decomposition (see Table 5B), this conclusion is only supported for one of the three country pairs: Ireland vs. U.K. For Austria versus Germany, sample characteristics now explain most of the difference in time spent looking after children, while for Denmark versus Greece, coefficients now play a larger role.

Concluding Remarks

In this paper, we present and compare the amount of time mothers in nine European countries reported looking after children under 16 years of age in 1996. The findings suggest that there are differences across the nine countries. When we take into account differences in socio-demographic characteristics and the parents' employment status across Europe, the cross-country differences in time mothers spent looking after children are not particularly well explained. When we decompose the estimated differences in time spent looking after children, not surprisingly, we do not find stronger results. The decomposition creates two components: one, that attributes differences across a country pair to differences in characteristics in the two countries, and another component that allows the same characteristics to have different behavioral effects.

There are several reasons why the differences across countries may not be well explained by socio-demographic and employment differences. Beginning with the measure of time spent looking after children, despite extensive "input harmonization" by EUROSTAT, it is still possible that the question used to elicit time use information is interpreted differently by respondents from different countries. Related to this point is the possibility that social desirability influenced mothers' reports of time spent looking after children. If there are cultural differences in attitudes about child rearing, it is likely that the extent of social desirability differs systematically across countries.

If the measure of time spent looking after children is comparable across the countries represented in the ECHP, then the socio-demographic and employment characteristics we considered in the multivariate model are not well suited to explain differences in the amount of time mothers spent looking after children. There are two obvious domains that are not captured by our multivariate models: cultural differences with respect to child rearing and differences in policies that may impact parents' employment and child care decisions.

The nine countries do differ with respect to such policies. For instance, Germany and Austria are both countries that offer relatively extensive parental leave periods (Bundesministerium für Familie, Senioren, Frauen und Jugend 1998). However, as the percentage of mothers with children in the appropriate age groups is relatively small in the countries considered in this analysis (see Table 2), differences in parental leave policies can hardly explain the differences in time spent looking after children across countries.

Another policy explanation might be the provision of child care. Among the countries covered in our analysis, child care provision rates are highest in Denmark (this is true for children in all age groups); whereas countries such as Ireland, Greece and Spain are characterized by substantially lower child care provision rates (OECD 2001). To the extent that the availability and cost of child care influence mothers' employment status, this effect is included indirectly in our analysis. However, if parents who have the option to use child care do so when the mother is not employed, it could explain some of the variation in time spent looking after children across countries.

Differences in tax policies regarding spouse's income are another possible reason for differences in employment status and, thus, time spent looking after children across countries. However, as in the case of child care, such effects are indirectly taken into account by controlling for employment status.

For mothers with older children, differences in school schedules might play a role in explaining cross-country differences. In Germany and Austria, for instance, children usually go home for lunch (Gornick et al. 1997), which most probably increases the time mothers reported looking after children.

Working time regulations also differ across Europe. While we control for the mother's full-time and part-time work status, we do not take into account to what extent mothers can arrange their work hours during the day due to flextime policies (Bertelsmann Stiftung 2001). Mothers with more flexible schedules can more easily combine work and family life. Among working mothers, we would expect that those with access to more flexible work hours spend more time looking after children. However, to the extent that flextime induces women to enter the labor force, it will decrease the amount of time mothers spend with children. Countries with relatively "family friendly" working schedules are the Netherlands and the Scandinavian countries (Bertelsmann Stiftung 2001). Mothers' labor force participation rates are much higher in the Scandinavian countries and mothers are also considerably more likely to work full-time in the Scandinavian countries than in the Netherlands.

A third domain that is not explicitly addressed in our analysis is fathers' involvement with children. How much time fathers spend with their children may be an important factor in explaining the amount of time mothers spend looking after children. As a father's time available to care for children is closely related to his employment, we control for this explanation to some extent by including measures of the father's employment in our analysis. Still, analysing father's and mother's time spent looking after children would be preferred. So far, few studies have focused on the relationship between father's and mother's caring obligations and these studies do not provide cross-country comparisons (e.g., Maume & Mullin 1993).

This paper provides a first comparison of the amount of time mothers in nine European countries spent looking after children in 1996. In addition, it provides a first step towards explaining the observed differences in mothers' time spent looking after children. As our results indicate that socio-demographic and employment characteristics are not well suited to explain these differences, further research is needed. This is particularly important, as the time spent with children may have important implications for children's well-being.

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APPENDIX

Prediction of Mother's Employment Status

For each of the nine countries represented in our analysis, we estimated a separate multinomial logit model of mother's employment status. Employment status is operationalized as: whether a mother was not in the labor force, whether she worked part-time (29 hours/week or less), or whether she worked full-time (30 or more hours/week). The explanatory variables for the model include: the age of the youngest child in the household, the number of children under the age of 16 years who live in the household and the number squared, whether the mother's education level is "medium" or "high" (see Table 1 for definitions of "medium" and "high"), the mother's years of work experience and work experience squared, whether the mother is a single parent, whether the mother cohabits, whether the mother's nationality differs from the country in which she resides, whether the mother is restricted in her activities due to illness, injury or mental health, the number of adults who live in the household, yearly household income from work net of mother's earned income, and yearly household income from sources other than employment. The following table presents the multinomial logit estimates for The Netherlands; "not employed" is the omitted category. Results for the other eight countries are available from the authors upon request.

Table A-1. Multinomial Logit Model of Mother's Employment Status

Variable	Coefficient Estimate	Standard Error	P > |z|
Part-Time Employment			
Mother			
Age	0.86	0.15	0.406
Age squared	1.00	0.003	0.075
Education			
- Medium	2.06	0.47	0.002
- High	2.55	0.85	0.005
Foreign	1.82	1.47	0.46
Health limitations	0.88	0.20	0.41
Marital Status			
- Single parent	0.07	0.10	0.08
- Cohabiting	1.62	3.37	0.82
Years worked	1.17	0.04	0.000
Years worked squared	0.99	0.001	0.000
Household			
No. Children < 16 yrs.	1.67	0.82	0.29
No. Children < 16 yrs. squared	0.88	0.09	0.21
Age of youngest child	1.11	0.04	0.004
Number of adults	0.18	0.27	0.26
Income other than mother's	0.99	0.006	0.28
Full-Time Employment			
Mother			
Age	0.79	0.20	0.35
Age squared	1.00	0.004	0.18
Education			
- Medium	1.51	0.48	0.20
- High	3.85	1.60	0.001
Foreign	2.34	2.23	0.37
Health limitations	0.69	0.23	0.28
Marital Status			

- Single parent	1.80	2.25	0.64
- Cohabiting	7.42	16.07	0.35
Years worked	1.24	0.07	0.000
Years worked squared	0.99	0.002	0.000
Household			
No. Children < 16 yrs.	0.78	0.51	0.70
No. Children < 16 yrs. squared	1.00	0.14	0.99
Age of youngest child	1.17	0.05	0.001
Number of adults	2.03	2.41	0.55
Income other than mother's	0.99	0.01	0.22
N	1,105		
Pseudo R^2	0.38		
Log likelihood	-655.50		

Source: ECHP 1996, authors` calculations.

Table A-2. Tobit Model of Mother's Time Spent Looking After Children in 1996: The Netherlands

Variable	Coefficient Estimate	Standard Error	P > |t|
Mother			
Age			
- 17-24 years	5.56	6.67	0.41
- 25-29 years	4.35	2.80	0.12
- 30-34 years			
- 35-39 years	-1.95	2.06	0.35
- 40-44 years	-5.79	2.56	0.02
- 45-67 years	-11.56	4.07	0.01
Education			
- Medium	0.88	1.91	0.64
- High	-5.49	2.51	0.03
Foreign	7.56	5.81	0.19
Single Parent	15.01	4.81	0.00
Employment			
- Part-time	-6.41	1.66	0.00
- Full-time	-8.24	2.70	0.00
- Self-employed	0.97	3.72	0.80
Father			
Employment			
- Employed	10.60	3.90	0.00
- Self-employed	-0.25	3.11	0.94
Household			
Youngest Child			
- < 1 year	35.11	5.48	0.00
- 1-2 years	29.77	4.01	0.00
- 3-5 years	20.34	3.91	0.00
- 6-12 years	11.64	3.51	0.00

Table A-2. Tobit Model of Mother's Time Spent Looking After Children in 1996: The Netherlands

Variable	Coefficient Estimate	Standard Error	P > |t|
Number of children			
- Beyond 1 child	4.46	1.93	0.02
- Beyond 2 children	0.21	2.7	0.94
Household Size	-0.83	7.77	0.92
Income			
- Work Income	0.07	0.05	0.16
- Non-work Income	-0.02	0.41	0.97
Dishwasher	-2.9	1.60	0.07
N	1,103		
Log likelihood	-4.598.07		

Source: ECHP 1996, authors` calculations.