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Interactions between care-giving and paid work hours among European midlife women, 1994 to 1996

C. KATHARINA SPIESS* and A. ULRIKE SCHNEIDER†

ABSTRACT

This paper uses data from the *European Community Household Panel* surveys of 1994 and 1996 to study the association between changes in care-giving and changes in weekly work hours. Our sample comprises women aged 45–59 years who participated in the labour force in at least one of the two years studied. Controlling for country variation, we find significant relationships between starting or increasing informal care-giving and changes in weekly work hours. No such association is found however among women terminating a care-giving commitment or reducing their care hours. Starting care-giving significantly reduces work hours for women in northern European countries (except Ireland). By contrast, women in southern Europe and Ireland respond to an increase in care-giving hours by a smaller increase or a higher decrease in work hours than non care-givers. In summary, our results show that the impact of care-giving on adjustments of weekly work hours is asymmetrical and that it differs in southern and northern Europe.

KEY WORDS – employment, care-giving, elder care, informal care, family care, care hours, long-term care policy, Europe.

Introduction

This paper examines the relationships between care-giving and employment among women in Europe during the mid 1990s, and specifically addresses the question, is employment adversely associated with informal care? If this is the case, there would be grounds for the deepening policy concern about the effects of women's increasing labour force participation on the future supply of family care. Studies of employment and care-giving frequently focus on women, who are more likely to be care-givers, and

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who provide more intensive support than men. They tend to be confronted with a sequence of care demands over their adult lifecourse, starting with child-care, and followed by the care of spouses, frail parents and grandchildren. There has been substantial economic research on the relationship between child care and female labour force participation, if little on informal care to older dependants,[1] but most has been in the United States and Canada, whereas similar research remains scarce in Europe. This preliminary contribution uses data from the *European Community Household Panel* to investigate the association between changes in weekly hours of work and changes in care-giving for midlife women.

Theoretical background

The relationship between care-giving and work has been studied in the labour supply, home production and care-giving literatures. Several contributions apply microeconomic time allocation theory to derive testable hypotheses about the time-use patterns of care-giver households.[2] The time allocation model suggests that decisions on work hours and care hours are interrelated, because care-giving and employment compete for the care-giver's time. Individuals derive utility from both activities, such as earnings and self-esteem in the case of employment, and 'emotional returns' from care-giving.[3] The model predicts that care-givers allocate their time in a way that generates the same utility for an *additional* hour of time in paid work, leisure or care-giving. An increase in the marginal utility of care-giving *ceteris paribus* prompts a reduction in the hours of work and leisure (and vice versa).

The marginal value of care-giving depends on several factors, such as the care-recipient's health, the hours of care provided by third parties, and the prices of market substitutes for informal care. Similarly, changes in the marginal utility of paid work will affect the relative attractiveness of time spent on leisure or home production. The value of an hour of the care-giver's time spent in paid employment can be measured by the wage rate. The higher the actual wage rate or a care-giver's earnings potential, the higher the 'opportunity cost' of care-giving. If learning by doing and specialisation increase the productivity of either care-giving or paid work (or both), the strength of the trade-off between care-giving and employment will change over time. It will depend on individual work and care-giving histories.

We further expect the association between work and care-giving to differ for women who begin care-giving as compared to those who give it up. For women who take on care-giving responsibilities, the marginal

utility of a unit of time spent in both care-giving and employment should be higher than the two marginal utilities at the end of a care-giving episode, because the long-run effect of fewer hours of work or of quitting work altogether is to reduce the care-giver's earning potential, and thus their marginal utility by means of employment. At the same time, the literature on care-giver stress points to a decrease in the marginal utility of care as its intensity (and possibly duration) increases.

Time allocation models employ a standard set of assumptions from microeconomic theory, among them that rational, unrestricted and voluntary choice is exercised (Kooreman and Wunderink 1997: 25–7). In the case of family care, however, it is plausible that irrational, restricted and more or less involuntary decision-making is more common, for 'rational choices' require the absence of emotional turbulence as well as sufficient information. When close family members suddenly require high levels of personal care, one may well doubt the rationality of the precipitate arrangements. Shock and a lack of information about formal and informal sources of support are likely to result in rushed, inadequate decisions on care-giving and employment. In the long run, however, care-givers are likely to acquire more information, as about the prices of formal care or the realised 'emotional returns' of informal care, and through this to revise their expectations about the costs and benefits of various care arrangements.

Unrestricted choice, the second implicit requirement of rational-choice models of time allocation, implies that care-givers can realise any combination of work and care hours. Unfortunately, rationing is likely in the case of the care of frail older people. Informal care-givers who would prefer to purchase formal care services may find them unavailable or in short supply. Some might wish to share the responsibility with other family members, but the feasibility of this option depends on the size and structure of kin networks. An individual care-giver's choice is also contingent on the incomes, needs and preferences of other household members.

Restrictions on the allocation of time are likely to depend on the personal characteristics, family situation and institutional context. The sociological literature on caring and employment highlights the gender, age and marital status profiles of potential and actual care-givers. Referring to the United Kingdom, Arber and Ginn (1997: 354) remarked that, 'married women below retirement age are most constrained by caring for elderly people and are particularly likely to experience it as burdensome'. Carmichael and Charles (1998: 749, note 5) suggest that 'women have a greater ability to vary their hours of work, and other such conditions of employment'. Several authors draw attention to the strategy

of changing from full-time to part-time work to accommodate care-giving, and hypothesise that such a transition is easier for employed women than men (*e.g.* Schneider *et al.* 2001).

Limits to personal choices can be objective or subjective. Some restrictions are manifest (*e.g.* fixed work schedules) while others are not precise or stipulated, as with the social norms and customs of family care-giving. According to Arber and Ginn (1997: 354–5), in contemporary Britain the social pressures on women to provide family care are high, especially in comparison to the expectations of married men below retirement age: 'The primacy of the ideology of the male-breadwinner role largely protects them from all but minimal involvement in informal care, such as providing support at times which fit into their own work routine'.

As regards freedom of choice, Carmichael and Charles (1998: 753, note 10) note that 'chronic illness in a relative or close friend is something beyond the individual's control; the only choice involved is whether or not one cares for them. In a situation of limited alternatives and emotional commitment to the person affected, that must frequently seem as no choice at all'. Arber and Ginn (1999: 323) discern 'two ideal types of caring trajectories': that which occurs after long-time co-residence, and that which requires either the carer to provide care at a separate address or the carer and care-recipient to join their two households. They hold that in the former case 'caring is largely by default', while in the latter it is more deliberate, and they conclude that 'caring is more likely to influence employment participation than vice versa, when the care-giver has little choice about whether to provide care' (Arber and Ginn 1995: 450).

Despite its limitations, the time-allocation model can usefully be applied to the relationship between care-giving and employment. It focuses on the trade-off or association between the two activities, whereas other models of caring, such as those based on social exchange, reciprocity or altruism, set out to explain the provision of care but do not consider the impact of caring on employment.[4] Furthermore, the model of rational time-allocation explicitly predicts how changes in one activity affect time use in another. The data used in this analysis have the particular advantage of providing information on work and care *hours*, not just employment and care-giving *status*. The availability of this rich information invites a form of analysis that explicitly models the hours of time spent on the two activities.

Previous research

Because various research designs have been used to investigate the problem, the empirical economic literature offers inconsistent findings on

the work-care relationship.[5] The ideal empirical modelling approach would allow for simultaneous decisions on the two activities, but most studies do not properly account for the 'two-way' relationship (Arber and Ginn 1995: 448). They have either taken employment status or care-giving status as given, *i.e.* they are treated as *exogenous* variables which do not have to be explained by the underlying model.[6] Various published analyses illustrate the approach, as for example several studies in Canada (Rosenthal *et al.* 1999) and the United States (Brody and Schonoover 1986; Gerstel and Gallagher 1994; Starrels *et al.* 1995) that have tested a care-giving 'crunch' hypothesis – that employment has a negative impact on the odds or intensity of informal care – but found little empirical support. In like manner, care-giving status has been used as an exogenous predictor of employment, but with inconclusive results. Referring to the United States, Pavalko and Artis (1997) and Mutschler (1994) found hours of helping to be inversely associated with work hours, but Franklin *et al.* (1994) showed that care-giving prompted short-term rather than long-term adjustments of paid work.

Evidence on the relationship between employment and care-giving has also been presented for the United Kingdom (for a review, see Parker 1985). Several studies have used nationally representative data from the Office for National Statistics surveys on informal caring conducted as part of the 1985, 1990 and 1995 *General Household Surveys* (GHS) (Office of Population Censuses and Surveys 1982, 1992 *a*, 1992 *b*; Rowlands 1995).[7] Using the 1985 data, Carmichael and Charles (1998) tested for the substitution, income and respite effects of the association between employment and care-giving. Their hypothesis was that an increase in care needs implied an increase in the shadow (or imputed) wage rate of care-giving time that was required to persuade care-givers to provide additional hours of care ('substitution effect'). However, the impact of caring on employment participation will be smaller the higher the income and respite effects relative to the substitution effect. The authors verify these hypotheses using 1985 data for a representative sample of women aged 21–59 years, excluding self-employed women but including women who were not in paid employment. Care-giving increased the likelihood of labour market participation, indicating that the combined income and respite effects in fact dominated the substitution effect. At the same time, care-giving was found to reduce the number of hours spent in paid work. Caring also reduces the wage rate, which is an independent and significant predictor of labour force participation: carers were found in fact to earn four per cent less per hour than non-carers (Carmichael and Charles 1998: 754–6). There are several reasons for this negative association: loss of productivity at the work place, the fact that carers take jobs for which they

are over-qualified, or the time constraints that restrict the range of jobs a carer can take (1998: 750).

Arber and Ginn (1995) used 1990/91 GHS data to estimate the log odds of employment for men and women in relation to carer status and care hours. The models for women used three dichotomous variables: whether a person was in paid work, in full-time employment, or in part-time employment. The estimations show that care hours were inversely related to employment, but that the majority of care-givers did not withdraw from the work force altogether but rather opted for reduced work hours. The study further reveals that the association between employment and care-giving is 'gendered and influenced by marital status' (Carmichael and Charles 1998: 467). Parker (1995: 44) similarly reported a significant effect of caring on the employment status of British women aged 55–64 years: the odds of being in paid work were 14 per cent lower than for all women in the same age group. Her study did not however examine the intensity of care.

To the extent that decisions on paid work are interrelated with decisions on adult care, the findings reported in the previous paragraphs are subject to a simultaneity bias. Another weak feature of previous research on employment and care-giving is that it has often used samples of workers or non-probability samples of care-givers. In these cases, the findings are subject to selectivity bias. Studies, for instance, that focus on those who are both employed and care-givers miss both *potential* care-givers among employees and care-givers that gave up employment to meet the care-recipient's needs (*e.g.* Anastas *et al.* 1990; Franklin *et al.* 1994; Scharlach and Boyd 1989). Such a sample design also excludes people who are either looking for or opting out of work for reasons other than their care-giving commitments.

Pavalko and Artis (1997) present a research design that avoids the selectivity problems. They use United States nationally representative, longitudinal data on female care-givers aged 50–64 years to investigate the relationship between *changes* in care status on the one hand and usual work hours on the other, although their analytical design is problematic.[8] They compare: (a) female employees with and without care-giving responsibilities, and (b) female care-givers in paid employment with those who are not employed. The findings show that the likelihood of being a care-giver is independent of employment status; and that the impact of care-giving on work intensity (hours in paid work) is asymmetrical, depending on whether care-giving is being taken up or terminated: starting care-giving adversely affects work hours, while stopping care provision is not associated with increases in work hours.

Simultaneous estimates of employment and care-giving based on representative United States samples have been presented by Wolf and

Soldo (1994), Ettner (1995) and Johnson and Lo Sasso (2000). Wolf and Soldo did not find a significant negative relationship between care-giving and employment, while the other two studies reported large and significant negative effects of care-giving on work hours. In addition, Schneider and Wolf (2000), using a 1996 national cross-section of the *European Community Household Panel* (ECHP), have presented evidence from Germany on the impact of care-giving to adults (irrespective of family bonds). Their bivariate probit model controls for both simultaneity and selectivity. In the relatively small sample of 227, they found a small but statistically insignificant trade-off between care-giving and employment. Another recent German study, using data on co-resident care-givers from the *German Socio-Economic Panel* (GSOEP), applied event-history analysis to the study of the work-care relationship (Schneider *et al.* 2001). Controlling for other factors, the authors found that the presence of a care-recipient in a household had a significant effect on the transition from employment to non-participation, while changing from full-time to part-time work did not emerge as a common strategy for reconciling work and family care (2001 : 377).

The European country study

We now turn to the evidence from the 12 European countries. The reported analysis used a sample design that avoided selectivity bias and allowed us to compare care-givers and non care-givers among employees. As the focus was on the *adjustment* of work hours, women were not included if they were not working in 1994 and 1996. Separate regressions (not reported here) indicate that the exclusion of this group of non-working women does not introduce selection bias. Rather than test a structural model of simultaneous decisions about work and care hours, a descriptive approach was employed to account for the relationship between, on the one hand, changes in care-giving status and intensity and, on the other hand, changes in work hours.

Data, methods and measures

The analysis is based on data from the *European Community Household Panel* (ECHP), a multi-purpose longitudinal survey set up and funded by the European Union. The first wave was undertaken in 1994 in 12 member states, and sampled 61,106 households and 127,000 individuals aged 16 and more years. The response rate attained 71 per cent over all countries, with the lowest in Luxembourg (40%), and the highest in Italy and Greece

(90%) (Eurostat 1996c).[9] The ECHP collects information on income, employment, housing, migration, education, health, and child and adult care. Our analysis uses the few questions about care-giving to adults who need special help as a result of old age, illness or disability. The survey focuses on regular care-giving to people living in the same household or elsewhere. It identifies care-givers among adult household members, (aged 16 years and over) and provides information about the average weekly hours of care-giving.

The ECHP data are well fitted for the analysis of adult care. To begin with, they avoid selectivity bias and thus allow examination of several simultaneous states, such as employment and care-giving, employment and no care, no employment and care-giving, and neither employment nor care-giving. Secondly, most European national panels and surveys have failed to ask whether a person is involved in caring other than for children, while surveys of adult care do not always include a measure of intensity. In addition, the ECHP information on individual care responsibilities can be linked with numerous employment variables that were collected from every person aged 16 and more years, and the sample is relatively large, *e.g.* more than 12,000 middle-aged women participated in the 1994 survey. Last but not least, because 'input harmonisation' was employed during the data collection, there is less than usual doubt about the comparability of results across countries.[10] We have analysed changes over time in work hours and care-giving among the sample of women aged 45–59 years who reported *any work hours* in the two years of the study (1994–96). The 12 countries that participated in all the first three waves of the ECHP are included, and models have been calibrated for regional sub-samples.[11]

The analysis uses ordinary-least squares regression to explore the association between *changes* in work hours and *changes* in care-giving hours. By focusing on changes, we follow Pavalko and Artis's (1997) suggestion for avoiding selectivity problems, although we specify our model in a different way.[12] Our estimation for Europe uses a simplified version of a difference-in-difference approach, using the following empirical model:

$$y_{t+2} - y_t = \beta_0 + \beta_1 * Z + \beta_2 * X_t + \varepsilon$$

In this model, y denotes work hours, t is a time index, Z is a vector of independent variables that represents the change from t to $t+2$ in either care status or care intensity, X is a vector of independent variables that describe the 1994 baseline situation, and epsilon (ε) denotes the error term. The dependent variable y is the absolute *change* in weekly work hours from

1994 to 1996, which was directly collected in all waves of the ECHP. To measure the changes in care-giving hours, however, five independent dichotomies were derived to capture each respondent woman's changes in care-giving status and intensity over the two years: (i) whether she stopped care-giving, *i.e.* had been a care-giver in 1994 but not in 1996, (ii) whether she started care provision, (iii) whether she increased care-giving, (iv) whether she decreased care-giving, and (v) whether she was a carer in 1994 and 1996 but with unchanged intensity (see Table 1). A change in this intensity was defined as moving between three levels of time commitment defined as: 1–13, 14–28, and 29 or more hours per week.[13] Not care-giving in both 1994 and 1996 is the reference case.

The second category of predictors are the micro-level variables for individual characteristics and circumstances at the time of the first interview in 1994: age, education, nationality, health, employment status, family status, household type and income status. Average values and standard deviations of the independent variables are shown in Table 1. Income and wealth variables have been found to have little influence on the likelihood of care-giving, but they may affect the employment and care-giving relationship among economically distressed households, and they may have increasing importance over the course of a care-giving relationship.[14] Household net income in 1994 is used to represent economic status, which includes the earnings and non-work income of all household members (excepting the respondent's earnings).

Finally, the models include country dummies that capture the influence of the institutional setting and macroeconomic conditions on adjustments of work hours. In addition, models for sub-samples living in one of two country groups were estimated. Group A comprises Belgium, Denmark, France, Germany, Luxembourg, The Netherlands and the United Kingdom, all of which have well developed institutional care and formal home-help services (Table 2).

Group B comprises Greece, Ireland, Italy, Spain and Portugal, which are characterised by relatively little institutional care and formal home-help, and in which family support and intergenerational households are more common.[15] Denmark is the reference case in all models except those for women living in the Group B countries (for which Greece is the reference case). In Denmark, more than one in 10 older people receive formal home help services, a very high proportion of older people live in institutions, and female labour market participation is well above the European Union average (European Commission 1999). Greece's comparable attributes are at the opposite extreme, *e.g.* only a tiny percentage of its older people live in institutions.

TABLE 1. *Definitions and descriptive statistics of the independent variables*

Variable	Description	Mean	Standard deviation
Care-giving			
Start care	Start care-giving in 1996=1	0.05	0.22
Stop care	Stop care-giving in 1996=1	0.08	0.26
Increase care hours	Increase in care hours 1994 to 1996 (care-giving both times)=1	0.01	0.12
Decrease care hours	Decrease in care hours 1994 to 1996 (care-giving both times)=1	0.01	0.12
Stable care hours	No change in care hours 1994 to 1996 (care-giving both times)=1	0.03	0.16
Socio-demographic characteristics in 1994			
Age	Age (in years)	48.81	4.12
Age^2	Age squared	2,399.34	4,083.86
Education	Second/third level education=1	0.49	0.50
National	Nationals=1	0.98	0.14
Married	Married=1	0.79	0.41
Unwed	Never Married=1	0.07	0.25
Health	Housework limited by health=1	0.11	0.31
Children <12 years	Child(ren) younger than 12 years of age in household=1[#]	0.11	0.31
Children 12–15 years	Child(ren) 12–15 years of age in household=1[#]	0.14	0.35
Household net income	Exogenous yearly household net income in 1994 (€k)	17.29	15.62
Employment characteristics in 1994			
Part-time work	Working part-time in 1994=1	0.28	0.45
Full-time work	Working full-time in 1994=1	0.63	0.48

Country			
Belgium	Living in Belgium = 1	0.04	0.21
Denmark	Living in Denmark = 1	0.07	0.25
France	Living in France = 1	0.12	0.33
Germany	Living in Germany = 1	0.11	0.32
Greece	Living in Greece = 1	0.09	0.29
Ireland	Living in Ireland = 1	0.05	0.23
Italy	Living in Italy = 1	0.13	0.34
Luxembourg	Living in Luxembourg = 1	0.02	0.12
Netherlands	Living in the Netherlands = 1	0.07	0.26
Portugal	Living in Portugal = 1	0.11	0.32
Spain	Living in Spain = 1	0.08	0.27
United Kingdom	Living in the United Kingdom = 1	0.09	0.28

Source: ECHP, 1994 and 1996 (midlife women), own calculations.
Notes: N = 6,390; [#] As these variables are not included in the 1994 wave, this information refers to 1995.

T A B L E 2. *Use of institutional care and formal home care by those aged 65 or more years, European countries in the early 1990s*

Percentage	Country
Receiving long-term care in institutions	
Less than 1	Greece
1–4.4	Spain, Italy, Portugal
4.5–5.4	Belgium, Germany, France, Ireland, United Kingdom
5.5–6.4	Denmark
6.5 or more	Luxembourg, Netherlands
Receiving formal home-help	
Less than 5	Spain, Ireland, Italy, Portugal
5–9.9	Belgium, Germany, France, Netherlands, United Kingdom
10 or more	Denmark

Source: OECD 1996, as quoted by the Royal Commission on Long-term Care (1999: 161).

Results of the bivariate analyses

In the 12 European Union countries that have been studied, every other woman aged 45–59 years participated in the labour market in 1994, and one in seven provided care, while one in 16 (6%) combined employment and care-giving. Employment and care-giving appear on first examination to be negatively related, for the countries with the highest labour force participation rates reported relatively low percentages of midlife care-givers, and vice versa. The highest labour force participation rates of midlife women were in Denmark, the United Kingdom and Germany, while care-giving was most prevalent in Italy, Spain and Greece.

Table 3 presents the prevalence of care-giving commitments, of changes in care-giving, and of changes in work hours for our sample of *working* midlife women. The majority (82%) of the respondents in the estimation sample (which includes women who were working in 1994 or 1996 or both) did not report care-giving in either year. Among the minority of care-givers, however, most experienced a change in either care status or care hours (irrespective of changes in work hours). Less than three per cent of the care-givers did *not* report a change from one to another of the 'low', 'medium' and 'high' intensity groups (although they may have made small adjustments within the categories or in the type of help provided). As to work hours, for some 31 per cent of the respondents they did not change at all; and another 31 per cent either started working or increased work hours. The largest group (37%) decreased their work hours or stopped working altogether, which might indicate transitions caused by care responsibilities or quite other reasons.

TABLE 3. *Changes in care-giving and employment in 12 European Union countries, 1994 to 1996*

Care-giving change, 1994 to 1996	Employment change, 1994 to 1996					
	Start working	Working both times: hours same	Working both times: hours increase	Working both times: hours decrease	Stop working	Totals
Not care-giving both times	8.7	32.0	22.6	24.7	12.0	100.0
	77.9	*84.4*	*83.0*	*81.1*	*79.47*	*82.1*
Care-giving both times: hours same	11.5	31.6	21.2	27.1	8.6	100.0
	3.2	*2.6*	*2.4*	*2.7*	*1.7*	*2.5*
Start care-giving	9.4	29.0	19.9	24.8	16.8	100.0
	5.2	*4.7*	*4.5*	*5.1*	*6.8*	*5.1*
Care-giving both times: hours increase	7.7	23.0	20.4	27.9	21.0	100.0
	1.2	*1.1*	*1.3*	*1.6*	*2.4*	*1.4*
Care-giving both times: hours decrease	14.4	24.4	25.9	23.4	11.9	100.0
	2.4	*1.2*	*1.8*	*1.4*	*1.5*	*1.5*
Stop care-giving	12.6	25.4	21.3	27.1	13.7	100.0
	10.2	*6.1*	*7.1*	*8.1*	*8.2*	*7.4*
Totals	9.2	31.1	22.4	24.9	12.4	100.0
	100.0	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

Source: ECHP, 1994 and 1996 datasets (midlife women) (percentages are weighted), own calculations.
*Note*s: (N=6,390) (first row: row percentages, second row: *column percentages*). Pearson χ^2 (20 degrees of freedom)=36.56, p=0.013.

Table 3 further shows that changes in care-giving status or care intensity covaried with changes in employment. The Pearson χ^2 test indicates that there is a significant relationship between changes in working and care-giving time. Among the respondents that changed their care-giving commitments, 70–75 per cent report a change in their employment status or work hours. Similarly, among those who changed their work commitment, 15–20 per cent also changed their care-giving status or intensity (hours). Some but not all of the bivariate relationships are consistent with the hypothesised negative association. In particular, reductions in work hours occur most frequently among the respondents who increased their care-giving, and the share of women who stopped working was highest among those with an increased intensity of care-giving (21%), followed by those who started care-giving (17%).

Some of the empirical associations cast doubt on the existence of a conflict between employment and care-giving (Table 3). One of the unexpected observations, for example, is that while starting or increasing care-giving associates with reductions in weekly work hours, a different response is found when care-giving is terminated – the adjustment in work hours is in the same direction, for a greater percentage of the respondents decreased rather than increased their work hours. It is therefore found that the response of employment to changes in care-giving is asymmetrical. On the whole, however, changes in employment and informal care display an interesting communality. On average, midlife women tend to reduce the time that they spend on both of these 'productive' activities, and this association overrides or masks an inverse relationship between work and informal care. Generally, it is not found that one activity increases at the expense of the other.

Multivariate analysis

Using a multivariate approach to explore the association between changes in work hours and changes in care-giving reveals further associations. Table 4 shows the results of the ordinary least-squared regressions on the change in work hours from 1994 to 1996. It should be noted that the sign of a coefficient for an independent variable would be interpreted differently for increases and reductions in hours. For increases in work hours, a positive coefficient indicates that the variable promotes the effect, and a negative coefficient indicates restraint; but for decreases in work hours, a positive coefficient indicates restraint and a negative coefficient reinforcement. Separate models for positive and negative adjustments in work hours have therefore been calibrated, to elucidate the inconsistent

T A B L E 4. *Ordinary least squares regressions of changes in work hours, 1994 to 1996*

Variables	Change in work hours		Increase in work hours		Decrease in work hours	
	Coefficient	z statistic	Coefficient	z statistic	Coefficient	z statistic
Care variables[1]						
Start care	−2.41	2.70**	n.s.		2.36	2.31*
Increase care	−5.03	2.48*	n.s.		4.79	2.14*
Socio-economic variables[2]						
Part-time work	−29.51	36.96**	−22.21	29.08**	−4.47	10.88**
Full-time work	−37.29	47.77**	−26.47	36.94**		
Age	3.82	3.16**	n.s.		−2.99	2.21*
Age[2]	−0.04	3.43**	n.s.		0.03	2.48*
Education	2.59	6.29**	n.s.		−3.15	6.71**
Married	−1.05	1.92+	n.s.		n.s.	
National	n.s.		n.s.		−4.50	2.31*
Health	−1.90	3.07**	n.s.		1.77	2.57*
Household net income	−0.05	3.09**	n.s.		0.04	2.26*
Country variables[3]						
Germany	−1.69	2.38*	−1.05	2.35*	n.s.	
Netherlands	−2.16	2.93**	−2.47	4.92**	n.s.	
Belgium	−2.24	2.37*	n.s.		2.90	2.67**
France	n.s.		1.24	2.67**	2.56	2.90**
UK	n.s.		n.s.		1.89	2.00*
Ireland	−3.81	3.44**	n.s.		6.12	4.67**
Italy	−1.35	1.73+	1.07	2.25*	2.89	3.32**
Greece	−4.75	4.69**	4.73	6.40**	9.97	8.98**
Spain	−1.96	2.00*	3.28	4.10**	5.27	5.04**
Portugal	n.s.		2.96	4.60**	3.78	3.73**
Sample size	6,390		3,998		4,398	
R-squared	0.33		0.52		0.10	

Sources: ECHP 1994 and 1996 datasets (sample of midlife women), own calculations.
Notes: n.s. not significant; + significant at 10%; * significant at 5%; ** significant at 1%. Coefficients and *z*-statistics for constant term not shown.
[1] Other 'care-variables', which had no significant effect in any of the three models were 'Stop care', 'Decrease care' and 'Stable care'.
[2] Other 'socio-economic-variables', which had no significant effect in any of the three models were 'Children under 12 years', 'Children 12–15 years' and 'Unmarried'.
[3] Another 'country-variable', which had no significant effect in any of the three models was 'Luxembourg'.

effects. The results of the models for the entire sample of 12 European Union countries are first examined (Model 1).

Results of the 12 country models

Beginning with the results for *care-giving change*, an asymmetrical response of work hours to changes in care-giving is shown. The 'start care' and 'increase care' predictor variables have significant coefficients: both are negatively correlated with change in the number of weekly work hours,

with slight variations in the different estimation samples. On the other hand, terminating care, reducing care effort, or maintaining the same care intensity are insignificantly related to change in work hours (Table 4, first column). This pattern is consonant with results for the United States from Pavalko and Artis (1997). The results for Models 2 and 3 also show that additional care-giving responsibilities do not affect the increase but, rather, reinforce the decrease in weekly work hours (Table 4, second and third columns). In addition we find that switching to a new level of care intensity results in a larger change in work hours than starting the provision of care. This pattern is to be expected since prolonged care-giving careers usually begin at low levels and are followed by upward adjustments, as the condition of the care recipient deteriorates.

Among the *control variables* that represent the respondent's situation in 1994, the coefficients for full-time and part-time work status are very significantly related to a change of work hours in nearly all the models. Compared to women who have not been working in 1994, the increase in work hours is significantly smaller for respondents who were working part-time in the start year. In the third model we find that reductions in work hours are significantly less for part-time than full-time workers.[16] This pattern may be explained by 'second-career' women, who are making up for time out of employment in their younger years, and who face difficulties in re-entering full-time jobs (see below).

Age, education, nationality, health and household net income were all significantly associated with changes in work hours. The results for Models 2 and 3 show, however, that the effects of these factors were only significant for downward adjustments in employment (Table 4). With regard to age, reductions in work hours are significantly smaller for older than for younger respondents, but the relationship is non-linear. Women who have completed a second or third level of education experience significantly less reduction in weekly work hours than those with a lower level of education. The relationship between health and change in work hours is in the expected direction: the decrease in work hours is *ceteris paribus* more pronounced for women reporting health problems in 1994 than for those in good health. Household net income only affects decisions to reduce work hours. At higher income levels, we find the decrease in work hours to be higher.

Turning to *country variations*, the first three models in Table 4 include country dummies to control for varying institutional and macro-economic settings. Except for Luxembourg, all of these country dummies have statistically significant coefficients, most at the one per cent level. Denmark, the reference case, is distinctive for the ease with which formal care services can be accessed, the above average utilisation of these

services, and above average labour force participation rates for women. Compared with Denmark, women in Germany and The Netherlands undergo significantly smaller *increases* in weekly work hours. On the other hand, these countries do not have differential effects on *decreases* in hours. The background factors in most of the other countries tended to accentuate both increases and decreases in work hours in comparison to the adjustments made by Danish women. The strongest effects were for the southern European countries and Ireland.

It is assumed that increases of work hours (including entries to the labour force) are affected by different institutional factors from those which influence downward adjustments (including exits from the labour force). High rates of female labour force participation, for instance, may go together with high rates of full-time employment and a relatively low proportion with intermittent work histories. In this case, the potential for an increase in work hours is relatively small, explaining the positive coefficients on the country dummies in the regressions for increased work hours. On the other hand, the supply and utilisation of formal care services should help midlife women cope with dual work and care-giving commitments, and, in the models for decreased work hours, may explain the relative large and positive coefficients for the countries with few formal services.

Variations in the two country groups

There may of course be many country-specific influencing factors, but it is beyond the remit of this paper to examine these in detail for each of the 12 countries. As a compromise, the following section unravels some of the complexities of the national policy and institutional setting by examining the estimated model results for the sub-samples of women living in the two previously described country groups A and B (Table 5). Among the variables of primary interest, starting to provide care or increasing the hours of care are again significantly associated with changes in weekly work hours. Taking on a new care-giving responsibility induces a reduction of paid work. Increasing weekly care hours has the same effect and also restrains increases of hours in paid employment. These patterns lend empirical support to the time competition hypothesis.

As just explained, Group A countries – all of which are in northern Europe – feature higher usage rates of formal elderly care services and of female labour force participation than Group B countries (Ireland, Spain, Portugal, Italy and Greece). The estimated models for the sub-samples of women living in the two country groups show that the significant impact of the 'start care' variable on changes in work hours is particular to northern

TABLE 5. *Ordinary least squares regressions of changes in work hours 1994 to 1996 by European country group*

| | Country group A | | | | | | Country group B | | | | | |
| | Change in work hours | | Increase in work hours | | Decrease in work hours | | Change in work hours | | Increase in work hours | | Decrease in work hours | |
Variables	Coefficient	z statistic	Coefficient	z statistic	Coefficient	z statistic	Coefficient	z statistic	Coefficient	z statistic	Coefficient	z statistic
Care variables[1]												
Start care	−2.54	2.36*	n.s.		2.89	2.32*	−2.52	1.71+	n.s.		n.s.	
Increase care	n.s.		n.s.		n.s.		−9.89	3.26**	−3.51	2.47*	7.03	2.15*
Socioeconomic variables[2]												
Part-time work	−26.73	24.03**	−22.66	21.05**	−4.36	8.51**	−30.44	26.36**	−20.25	17.97**	−4.36	6.28**
Full-time work	−32.81	29.32**	−25.48	24.18**			−40.33	38.22**	−27.06	27.87**		
Age	5.08	3.48**	n.s.		−4.58	2.76**	n.s.		n.s.		n.s.	
Age²	−0.05	3.67**	n.s.		0.05	2.96**	n.s.		n.s.		n.s.	
Education	2.28	4.48**	0.85	2.53*	−2.02	3.40**	2.96	4.35**	−1.77	3.55**	−4.59	6.03**
Married	−1.88	3.14**	−0.96	2.49*	1.22	1.70+	n.s.		n.s.		n.s.	
National	n.s.		n.s.		n.s.		n.s.		n.s.		−17.22	2.81**
Health	−2.82	3.94**	n.s.		2.73	3.35**	n.s.		n.s.		n.s.	
Household net income	n.s.		n.s.		0.04	1.89+	−0.11	3.22**	−0.11	3.82**	n.s.	

Country variables[3]

	1	2	3	4	5	6	7	8	9	10	11	12
Netherlands	−1.28	1.75+	−1.89	3.79**	n.s.							
Belgium	−2.28	2.42*	n.s.		3.03	2.80**						
France	n.s.		1.55	3.40**	2.86	3.26**						
United Kingdom	n.s.		0.90	1.56+	2.18	2.28*						
Italy							3.42	3.50**	−3.19	4.28**	−6.77	6.21**
Spain							2.94	2.58**	n.s.		−4.56	3.71**
Portugal							3.56	3.41**	−2.35	2.85**	−6.38	5.45**
Observations	3,364		2,201		2,387		3,026		1,797		2,011	
R-squared	0.30		0.52		0.07		0.36		0.51		0.08	

Source: ECHP 1994 and 1996, own calculations.

Notes: n.s. not significant; + significant at 10 %; * significant at 5 %; ** significant at 1 %. Coefficients and *z*-statistics for constant term not shown.

[1] Other 'care-variables', which have no significant effect in any of the three models: 'Stop care', 'Decrease care' and 'Stable care'.

[2] Other 'socio-economic-variables', which have no significant effect in any of the three models: 'Children under 12 years', 'Children 12–15 years' and 'Unmarried'.

[3] Other 'country-variables', which have no significant effect in any of the three models: 'Germany', 'Ireland' and 'Luxembourg'.

Europe (exclusive of Ireland), which at the same time has no statistically significant association between changes in care *intensity* and changes in work hours. Moreover, care-giving only affects downward adjustments in work hours in the northern sample, whereas it is connected to both increases and decreases in work intensity among women living in Ireland or southern Europe.

Since our analysis covers only two years, we do not know whether these responses are temporary. Evidence from both the United States and the United Kingdom shows that working care-givers use various short-term adjustments of their paid work to accommodate care responsibilities (Arber and Ginn 1995; Franklin *et al.* 1994; Mutschler 1994).[17] Once care arrangements are made, they appear to restore their work schedules. This could also be the effect captured in our analysis. Alternatively, one could hypothesise that the relationship between the start of care-giving and adjustments in work hours represents an all-or-nothing decision. Women (prepare to) exit the labour market to avoid dual work and care-giving commitments. Two influences could promote an abrupt response: societal norms, traditions and role expectations and, in clear contrast, the practical difficulties of sharing care-giving responsibilities with either others in the family network or with formal care services. Economic time allocation models stress the second type of barrier when combining employment and care-giving (Becker 1965; Blau *et al.* 1998; Kooreman and Wunderink 1997).

Women in Group A countries encounter fewer difficulties in accessing formal care services because of their relatively widespread availability. The role of the extended family is, however, smaller when compared to Ireland and the southern European societies (Hugman 1994; Rostgaard and Fridberg 1998). As long as care-givers are able (and willing) to substitute formal services for their own care efforts or for informal care provided by others, supply-side restraints still offer less of an explanation for the association between the 'start care' and the 'decrease work' variables in the Group A countries as compared to the Group B. Even though an *increase* in care intensity does not affect changes in work hours in Group A countries, we therefore contend that the finding suggests that *temporary* adjustments in work hours are made. Working women in northern Europe (except for Ireland) who face new care demands take some time to arrange their work and care-giving schedules. Once these arrangements have been made, they successfully combine work and family commitments and can even cope with a substantial increase in care intensity over time.

Women living in Ireland and the southern Europe countries, by contrast, respond to *additional* rather than to new care-giving commitments.

The coefficients for the 'increase care' variable have relatively high values, particularly in association with reductions in work hours.[18] Following the line of reasoning that was advanced for the Benelux countries, we suggest that in Denmark, France, Germany and the United Kingdom the start of care-giving does not affect changes in care hours because women encounter difficulties (or lack support) from their employers when it comes to temporary work adjustments. In addition, since the supply of formal care services is relatively low in Ireland and southern Europe, the challenge for women in these countries is to organise informal family care-giving. Coping with new care demands would then have a more pronounced effect on leisure. Once care demands exceed a critical threshold, Irish or southern European women cannot rely on formal care services and may have exhausted the sources of family support. They would then be forced to increase care-giving hours at the expense of the time they spend in paid work.[19] This interpretation of the results for women living in the two country groups of course requires further empirical testing, with analyses that cover longer intervals to distinguish temporary decreases in care hours from exits from the labour market. Moreover, the two regional sub-sample models still retain significant coefficients for the individual country dummies. Thus, there is much more to cross-national variation than has been captured by the two groups.

With regard to other *control variables* in our estimations for the A and B sub-samples, no substantial differences were found in the influence of work status, education and co-resident children on changes in work hours. On the other hand, the effects for age, marital status, nationality, health status and household income, were distinct to the country group. Age, marital status, and health had statistically significant effects for Group A countries; and national citizenship was only significant in Group B countries, where nationals decrease work hours much more than non-nationals. Household income had a significant effect on the reduction of work hours in Group A countries and on the increase of hours in Group B countries.

A final comparison of our results for Europe with those published for the United States by Pavalko and Artis (1997) shows more similarities than differences. This lends support to the hypothesis that, despite the markedly different policy contexts, there are common features in the interactions between changes in care-giving and changes in work hours. Starting or increasing care-giving significantly affects the weekly work hours (in the United States) or the changes in weekly work hours (in Europe) of midlife women, while stopping or decreasing care-giving does not produce significant adjustments of work hours. As mentioned before, the reasons could be twofold: the relationships either manifest the loss of human capital which prevents women from returning to the labour market, or it

indicates their strong motivation to hold on to the jobs that were hard to find in the first place.

Conclusions

This paper has reported the first findings from a study of the empirical relationships between the *changes* in care-giving and *changes* in weekly work hours in European Union countries. A better understanding of this association is particularly valuable given the coincident trends of population ageing and increasing female labour force participation. While we know that the growth of the population aged 65 years and older does not necessarily increase the population in need of long-term care, various empirical research projects indicate rising demand. And although we know that not all women wishing to join the labour market will actually succeed in doing so, there are solid reasons for predicting a continuing increase in the labour force participation of women of all ages and of midlife women in particular (Jenson and Jacobzone 2000: 12–3; Schulz *et al.* 2001: 34).

Given these two main trends, a better understanding of the relationship between care-giving and female labour supply is important. What do the results of this study contribute to attaining this aim? Our regression analyses provide evidence of a negative association between changes in work hours and changes in hours of care-giving. A change in work hours is significantly and negatively associated with the start or the increase of informal care-giving, while no such association emerges for women terminating a care-giving spell or reducing care hours. The latter result suggests that among midlife women, reductions in work hours or exits from the labour force are not likely to be recovered after care-giving responsibilities stop.

The negative association between *starting* to provide care and changes in work hours is significant only among women living in northern Europe (except Ireland), whereas the *increase* in care hours has a significant influence on adjustments in work hours for women living only in southern Europe and Ireland. It is suggested that this pattern reflects the greater substitution possibilities in the Benelux countries, Denmark, France, Germany and the United Kingdon, where utilisation rates for institutional and formal home care are higher. As a consequence, women in these countries have more choices when deciding on the level and type of care they want to provide. Temporary adjustments in work schedules, and a judicious mix of formal and informal care-giving, may explain why women in northern Europe (except Ireland) respond to new rather than

increasing care responsibilities. For female carers in Ireland and southern Europe, however, the provision of high levels of support is more incompatible than low-intensity care-giving with the maintenance of work commitments. The care-givers have to rely on their own and their relatives' inputs, which makes it increasingly difficult to combine work and care-giving as the latter intensifies.

Reviews of recent European nation government policies (Glendenning 1998; Pacolet *et al.* 1998; Kalisch *et al.* 1998) suggest some convergence of the factors influencing the level of family care-giving to frail adults. While the northern countries, such as the United Kingdom, Sweden and The Netherlands, are scaling back the provision of institutional care, some southern European countries perceive the need to increase the supply of formal care. It will be intriguing to use future waves of the ECHP data to track the effect of these changes on national differences in the relationship between employment and care-giving.

Overall, our results show that starting or increasing care-giving is accompanied by a decrease of weekly work hours. Moreover, the findings suggest that midlife women do not return to employment or resume their former work hours when they stop or reduce their provision of care. If further studies corroborate this relationship, the implications must be carefully considered in developing policies for both long-term care provision and to counteract the anticipated shortage of labour. Further research is needed on the simultaneity of women's decisions on work hours and care hours, to improve our understanding of country-specific effects, and to explore the role of economic distress in explaining patterns of work and care for midlife women. In addition, research should address the relative importance of short-term and long-term work adjustments to changes in caring. Franklin *et al.* (1994: 37–8) highlight the 'immediacy of the influence of acquiring the eldercare role on the employment adoption of women', and their major finding that little if any adjustment in working hours was reported three months after the beginning of a care role. They presume that there is a 'grace' period after a care-giving increase, during which support from employers or the community is provided. Their analysis was based on a small sample of 119 United States women and uses subjective data. Among our priorities for further analysis is to replicate this analysis with a large and representative European sample.

Acknowledgements

NOTES

1 This neglect does not extend to other branches of social science research. Also, there are many studies that use a quantitative research approach, *e.g.* Johnson and Lo Sasso 2000; Schneider and Wolf 2000; Ettner 1995, 1996; Franklin *et al.* 1994; Mutschler 1994; Joshi 1992; and Brody *et al.* 1987.

2 One example is the parent-care model presented by Johnson and Lo Sasso (2000: 5–10).

3 The emotional reward of providing care may be viewed as pure or impure altruism. Altruism implies a positive relationship between an individual's utility and the well-being of another person, the potential beneficiary (see Becker 1974, 1981). Hence altruism generates a psychic income to the benefactor, which explains her or his willingness to forego direct consumption opportunities for the benefit of others. Models of 'warm-glow giving' posit that the act of giving in itself generates utility for the benefactors and that the wellbeing of the beneficiary has secondary importance (Andreoni 1989).

4 Models of private support have a long tradition in sociology. The concept of reciprocity, for instance, predicts balanced flows over time of transfers given and received. Reciprocal exchange builds on stable, long-term relationships between members of small groups that nourish mutual trust and expectations of continuing exchange. The sociological concept of 'hierarchical support' holds that transfers are most likely within the immediate family and least likely among non-relatives (Hirshorn 1992: 956). Other theoretical approaches that may inform the analysis include human ecology theory and exchange theory (Franklin *et al.* 1994: 30).

5 See Wolf and Soldo (1994: 1260–2), Pavalko and Artis (1997: S170–1) and Tennstedt and Gonyea (1994) for brief reviews and discussions of empirical studies on care-giving and employment.

6 'An exogenous variable is one whose value is determined outside of the model. There is no explanation in the model of how it is determined' (Dougherty 1992: 322). Variables that are explicitly explained in one model, and hence are 'endogenous', may be treated as exogenous in another model. Thus, it can depend upon the structure and strategy of the models whether a change is considered exogenous or endogenous.

7 The data have also been used to investigate the levels and types of informal care provided by gender and age groups (see Arber and Ginn 1995, 1997 and 1999; Corti *et al.* 1994; Parker 1995).

8 The data are from the US *National Longitudinal Survey of Mature Women*, which surveyed women providing care to spouses, ill or disabled children, parents, or grandchildren (waves 1984 and 1987) (United States Bureau of Labor Statistics 2001).

9 For further details see Eurostat (1996 *a*, 1996 *b*); Clémenceau and Verma (1996); Wirtz and Mejer (2002); and the ECHP website at http://forum.europa.eu.int/Public/irc/dsis/echpanel/library.

10 It should be noted, however, that in spite of this standardisation effort, cross-national comparative research with ECHP data still has limitations. Some countries did not provide certain variables or use specific variable definitions, *e.g.* France collected information on only gross incomes, whereas others also collected after-tax income. Moreover, since the questionnaire had to be translated into several national languages, one might expect the wording of some questions to be interpreted slightly differently in the various countries (Schneider and Spiess 2002).

11 The included countries are Denmark, The Netherlands, Belgium, Luxembourg, France, the United Kingdom, Germany, Ireland, Italy, Greece, Spain and Portugal. The member states that are not included are Austria, Finland and Sweden: they joined the ECHP in 1995 (wave 2), 1996 (wave 3) and 1997 (wave 4) respectively.

12 Pavalko and Artis used the 'regressor-variable-approach' to estimate the association between employment and care-giving. They regressed hours worked in 1987 (y) on a vector of independent variables, and used 1984 work hours as a control variable. In doing so, they interpret the effect of the independent variables on *changes* in work hours. We argue, however, that this model is not equivalent to an explicit regression of the change of work hours on the same vector of control variables, and that it may entail problems of serial correlation, *e.g.* if there were a 'fixed effect' in y, whereby y_t is correlated with the error term in the equation for $t+3$.

13 The categorical change approach had to be used because the first wave ECHP question on usual weekly care-giving hours used pre-coded categories of hours.

14 McKinlay *et al.* (1995: 519) found, for example, that economic circumstances co-determined the transition into an institution: 'impact on the care-giver's time and financial situation, rather than impact on family life and work, appeared to lead to institutionalisation of the elder'.

15 The percentage of elderly people (age 65 years and older) receiving formal home care is less than five in Ireland and southern Europe, compared to 5–10 in Group A countries, and in all Group B countries except Ireland less than 4.5 per cent receive long-term care in institutions (Royal Commission on Long Term Care 1999; Pacolet *et al.* 1998; Rostgaard and Fridberg 1998; Hutten and Kerkstra 1996). The two groups reflect the debate on the European north-south divide in family care-giving (Hugman 1994; Glendenning 1998; Esping-Andersen 1997, 1999; Millar and Warman 1996).

16 Women who were not in paid work in 1994 drop out of the estimation sample for the third model presented in Table 4, because their 'decrease in work hours' is zero by default. Therefore, the third model contrasts the impact of a part-time work status against full-time employment.

17 Franklin *et al.* (1994) study seven short-term work adjustments in response to caring, namely: arriving late at work or leaving early, missing work without pay, taking sick or personal days, working after hours, refusing jobs or promotions, abstaining from job search and 'other work effects'. In addition, they examine leave of absence. Arber and Ginn (1995: 468) present evidence from the 1990/1 Great Britain *General Household Survey* on the time commitment to informal care and paid work. They conclude that 'for the vast majority of carers, their caring roles lead to work accommodation rather than influencing them to withdraw from the labour force'.

18 Interestingly, the association between increasing care provision and decreasing work hours does not emerge for those women in the Group B countries who were working in 1994. Further results of estimations for this 'sub-sub-sample' are not reported in this paper.

19 In their British study, Arber and Ginn (1995: 449 and 458) expected (and found) that change in work hours was more pronounced once care-giving exceeded a critical

threshold. Its level may vary by country, depending on the availability of formal services.

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