Access to Flexible Working and Informal Care

Mark L Bryan

Institute for Social and Economic Research
University of Essex

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Non-technical summary

It is often suggested that flexible working arrangements can be a solution to the problem of combining work and care. Yet while the availability and use of flexible working has been extensively documented in relation to childcare, there is very little evidence about flexible working and care provided to dependent adults. This paper explores the association between access to flexible working and the amount of care provided by employees.

The paper uses data on nearly 1600 workplaces in Britain together with a random sample of up to 25 employees in each workplace. These data enable us to match the flexible work arrangements available to each employee with the amount of informal care they give. Out of a range of flexible working practices we find that two − flexitime and the ability to reduce working hours − are each associated with about 10% more hours of informal care, and that this effect is the same for men and women. The ability to reduce working hours appears to facilitate care mainly among full-time workers, while there is evidence that flexitime seems to help with small amounts of care but does not affect the care provided by intensive carers. These two findings are consistent with previous research evidence that the main conflict between work and care is when individuals do large amounts of both, though they also suggest that flexitime may only be of limited use in alleviating this conflict.

We also attempt to distinguish between the mechanisms that lie behind the association between informal care and flexible work. Access to flexible work may increase the amount of care that people provide by increasing their availability to care at key times of the day, such as meal times. Alternatively, carers may seek out flexible jobs that are compatible with existing care commitments, or firms may respond to the presence of carers in the workforce by providing flexible work. We do not find evidence that carers change to flexible jobs in the short-term, or that firms provide flexible working because they employ many carers. However, we do find that wider aspects of the working environment beyond formal provision of flexible working seem to facilitate care provision, and that carers are more likely to be found in these carer-friendly workplaces. Flexible work policies at the workplace level also appear to be as important as flexibility at the individual job level.

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Abstract

We use matched employer-employee data to explore the relationship between employees' access to flexible working arrangements and the amount of informal care they provide to sick or elderly friends and relatives. Flexitime and the ability to reduce working hours are each associated with about 10% more hours of informal care, with effects concentrated among full-time workers providing small amounts of care. The wider workplace environment beyond formal flexible work also appears to facilitate care. Workplaces do not respond to the presence of carers by providing flexible work, instead there is some underlying selection of carers into flexible workplaces.

1. Introduction

It is estimated that nearly three million workers in the UK provide informal care – involving activities like shopping, cleaning and transport – to sick or elderly dependents (Yeandle et al, 2006). While there are carers in all age groups, carers are more often than not men and women in their forties and fifties, who are typically caring for parents or spouses (Yeandle et al, 2006; Heitmueller, 2007). Changes in life expectancy and employment in the coming decades are likely to increase the number of working carers and the challenges they face for several reasons. First, rising life expectancy will almost certainly raise the demand for informal care: the share of the population aged 75 or more is projected to rise from 8% in 2008 to 12% in 2033, and the share of the 85s and over – who will need more intensive care – will more than double, from 2.1% to 4.6% (author's calculations from ONS, 2009). Second, after some decline in employment rates at older ages (for men) in the 1980s, there is now an upward trend in later life working among both men and women. The average age of withdrawal from the labour force is now over 64 years for men and 62 years for women (ONS, 2008). Given long-term pressure on pension financing, further increases are likely. The combined effect of these changes will be that workers are potentially called upon to care for increasingly elderly dependents over longer periods of their own working lives, and that working carers themselves will be older on average. Combining paid work and care in these circumstances may prove to be a difficult balancing act. For governments that wish to encourage high employment rates and long working lives, but also need to ensure adequate care for vulnerable citizens, these changes pose a considerable challenge.

It is often suggested that flexible working arrangements can be a solution to the problem of combining work and care. Yet while the availability and use of flexible working has been extensively documented in relation to childcare, there is very little evidence about flexible working and care provided to dependent adults. Previous research into employment and informal care has mostly concentrated on the extensive work margin – does care reduce labour market participation and does working reduce the amount of care given? This paper by contrast looks inside the job at the association between access to flexible working and the amount of care provided. We use matched employer-employee data from the UK which contain detailed measures

of the availability of flexible working at both the workplace and job level. Out of a range of flexible working practices we find that two – flexitime and the ability to reduce working hours – are each associated with about 10% more hours of informal care, and that this effect is the same for men and women. The ability to reduce working hours appears to facilitate care mainly among full-time workers, while there is evidence that flexitime seems to help with small amounts of care but does not affect the care provided by intensive carers. Exploring the underlying mechanisms behind the flexible work / care relationship, we reject that workers move into flexible jobs as the need for care arises, or that firms respond to the presence of carers in the workforce by providing flexible work. However, part of the association of flexible work with care is explained by a non-random selection of carers into flexible workplaces, which may suggest that other aspects of the working environment are also important in facilitating care provision. The results suggests that while flexible work makes a small contribution to reconciling work and care, it is unlikely to have a substantial effect on the amount of care provided, or to encourage labour market participation by non-working carers.

The paper is structured as follows: Section 2 reviews previous literature about informal care and work. Section 3 outlines some theoretical considerations about the allocation of time to the market and informal care, which guide the formulation of the empirical model. In Section 4 we present the data, discuss some measurement issues, and examine the distribution of informal care and flexible working arrangements. Section 5 describes the ordered probit framework used to model care hours. We present the baseline results in Section 6, and investigate heterogeneous effects across work hours and the distribution of care hours. We then investigate the possible causal channels with a series of robustness checks using the rich establishment-level data to provide additional controls and to instrument access to flexible work in a bivariate ordered probit framework. Finally, Section 7 discusses the results and concludes.

2. Previous studies of care and work

A substantial literature has asked whether care interferes with employment and whether employment reduces care provision. The results are somewhat mixed, possibly because of data limitations and differences across studies in the samples and

definitions of care used, but overall there seems evidence of a causal relationship in both directions.[1] For the US, Ettner (1995, 1996), Boaz and Muller (1992) and Stern (1995) all find that care reduces the amount of paid work, while Wolf and Soldo (1994) find no effect. Ettner (1995) emphasises that carers withdraw from the labour market rather than reducing their hours, and Dentinger and Clarkberg (2002) find that care-giving hastens retirement (with a stronger effect among women than men). Evidence for Europe also indicates that more informal care is associated with lower employment levels (Bolin et al, 2008, for 10 European countries; Carmichael and Charles, 1998, and Heitmueller, 2007, for the UK). For Australia, Berecki-Gisolf et al (2008) find that taking up care is significantly associated with either giving up work or switching from full-time to part-time work, and Leigh (2010) also finds a modest reduction in employment probabilities due to care.[2]

Some authors argue that that the amount (and type) of care being provided is important for its effect on employment. There is evidence that only intensive care (more than 10 or 20 hours per week) has an impact on hours worked (Carmichael and Charles, 1998, 2003: Ettner, 1995).[3] Heitmueller (2007) reported there was an important distinction between caring for a dependent in one's own home (which generally involves more hours) and caring for a dependent person living separately (generally involving fewer hours of care). Co-residential care and care for more than 20 hours per week are both associated with reduced labour market participation, while extra-residential care seems to have little effect.

The is also evidence that employment (in particular full-time employment) reduces informal care (Dwyer and Coward, 1991; Boaz and Muller, 1992; Michaud et al, 2010), although some studies find no effect (Spitze and Logan, 1991). Again the amount of care may matter: some have suggested that employment only affects large

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[1] Some studies look at both men and women, while others focus on women, or married women only, and still others are limited to carers. There are also differences in the type of care analysed (for example all care versus care to parents) and the measure of care available: whether or not a carer, number of care hours or even a proxy for caring based on the presence of disabled parents.

[2] Most of these studies address the endogeneity of care in a work equation. Some papers conclude that care is exogenous (Bolin et al, 2008; Berecki-Gisolf et al, 2008), although others point to selection effects, concluding that carers tend to be individuals who would have low labour market attachment even if they did not provide care (Heitmueller, 2007; Leigh, 2010).

[3] Carmichael and Charles find that carers providing less than 20 hours per week of care are *more* likely to participate in the labour market than non-carers, although carers work fewer hours per week.

amounts of care (Spitze and Logan, 1991; Dwyer and Coward, 1991; Spiess and Schneider, 2003). If much care is provided in small amounts, employment effects may not be detected in studies looking only at whether or not cares takes place (for example, Henz, 2006; Berecki-Gisolf et al, 2008).[4]

The message which emerges from this literature is that the major conflict between labour market participation and care occurs for full-time workers with large burdens of care, and that small amounts of care are much easier to combine with work. However, despite the policy interest and frequent recommendations to promote flexible working (see for example, Berecki-Gisolf et al, 2008), little is as yet known about how far flexible working arrangements change the amount of care provided by employees or enable carers to take up work. We are aware of only one study (Henz, 2006) that examines the effects of flexible working on care provision and the work status of carers. Henz found there was no effect of flexible working availability on the timing of care take-up for women, and that flexible work did not delay the labour market exit of carers.[5] However, the indicators of flexible working used (including flexible hours, working at home, and getting care leave) were derived from data aggregated by socio-economic class. As Henz notes, this may make it more difficult to detect effects, because the flexibility measure refers to a person's broad occupation rather than their job, and the effects of flexibility may also be confounded with the effects of career structures.

This paper uses employer-employee matched data for Britain to investigate the impact of access to flexible working on care provision among employees.[6] The data contain more detailed indicators of flexible work (at both the workplace and job level) than were available to Henz (2006), and should be more accurate measures of the flexibility actually available to workers. Given the evidence that the interaction between work and care depends on the time devoted to them, we examine whether any effects of flexible working differ across the distributions of work and care hours. We also provide evidence about the potential channels by which flexible work and

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[4] Berecki-Gisolf et al (2008) do report that among women taking up caring, those with lower employment levels initially did more caring subsequently.

[5] For men, belonging to a socio-economic class with a higher share of part-time working was associated with faster transition into caring

[6] The nature of the data (restricted to employees) do not allow us to investigate the impact of flexible work on the employment status of carers.

care interact, including the sorting of carers into flexible workplaces and the possibility that workplaces provide flexible work because they have a large proportion of carers in the workforce.

3. Theoretical considerations

In line with some previous studies (Wolf and Soldo, 1994), the determination of informal care can be modelled as a time allocation problem. To motivate the empirical analysis, we present a simple individualistic framework that assumes individuals value their own consumption c, their leisure l and also the amount of care f provided to a dependent friend or relative.[7] Care can either be can provided directly by the individual (in hours h^c) or purchased as "goods" x at price p, for example by paying for hours of formal care or investing in equipment to aid the person being cared for. Care could also be supplied by another household member, in which case p can be considered as the shadow price of their time. The total amount of care will be a combination of formal and informal care, according to the production function $f(h^c, x)$. The time allocation problem is then to maximise

$$U(c, l, f)$$

subject to constraints

$$M + wh^w = px + c \qquad \text{(budget constraint)}$$
$$T = h^w + h^c + l \qquad \text{(total time constraint)}$$
$$h^w \geq 0; h^c \geq 0; l \geq 0 \qquad \text{(non-negative time constraints)}$$

where M is non-labour income, w is the wage rate, and h^w is the number of market work hours (and the price of consumption c is normalised to 1). The second constraint says that total non-sleep time T must be used for either leisure, work or care, while the practical relevance of the third set of constraints is in cases where $h^w = 0$ (non-participation in the labour market) or $h^c = 0$ (the individual is not a carer).

This model will yield supply functions for hours of informal care and hours of work and demand functions for consumption, leisure and formal care. In particular the care supply function can be written as $h^c = h^c(M, w, p)$, and we estimate this model as a baseline case in the empirical work. Thus far, the model does not incorporate constraints on market work, which are implicit in the idea that flexible work might

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[7] This is appropriate to the form of the data we have (i.e. there is no information on the person cared for or other possible care providers).

help workers do more informal care. One could think of adding a constraint like $h^c + h^w \leq g(z)$, where z is the availability of flexible work and $g(.)$ is some arbitrary function. This says that there is a given amount of time which must accommodate both market work and care, and that this time is effectively expanded if it is possible to work flexibly in the market. With this constraint added, the model will yield a care supply function $h^c = h^c (M, w, p, z)$, in which the availability of flexible work is expected to increase (on average) care provision by relaxing the time constraint.

The next section presents the data which we use to test this prediction and examines the key informal care and flexible work variables. Section 5 then introduces the empirical methods to be used to estimate the models of informal care.

4. Data

The data are taken from the Workplace Employment Relations Survey 2004 (WERS 2004). WERS 2004 is the fifth in a series of surveys based on representative samples of British workplaces. In the last two surveys (1998 and 2004), as well as collecting information from management and worker representatives, questionnaires have been issued to up to 25 workers within each workplace. This allows individual level data to be linked to workplace information, in particular for our purposes, data on the number of hours of caring activity (and other individual characteristics) can be linked to workplace availability of flexible working practices. WERS 2004 covered workplaces with 5 or more employees, achieving a sample of 2295 workplaces and 22451 individual worker responses (Kersley et al, 2006).

The data used in the analysis are taken from the survey of employees and the survey of managers (the survey of employee representatives does not include relevant questions about flexible working). The survey of employees was a self-completion questionnaire administered to a random sample of (up to) 25 employees in each workplace. The survey collected a set of socio-demographic measures, together with information about employees' experience of the job and workplace. Respondents were asked about the availability (to them personally) of a range of flexible working practices, discussed below. They were also asked whether and for how many hours per week they cared for family members or friends with health- or age-related problems. This is our key dependent variable.

The survey of managers was conducted by interviewing the senior manager responsible for day-to-day employment relations at the workplace. The survey included questions about whether any employees in the workplace had access to flexible working practices, listing a similar set of practices as the employee survey. Appendix A reproduces the question wording for the key flexible work and caring variables, and Tables A.1 and A.2 define and summarise the other variables used.

4.1 Flexible work arrangements

The basic set of flexible work arrangements asked about in WERS 2004 comprises: working at home in normal working hours, reductions in working hours (e.g. changing from full time to part time), increases in working hours (e.g. part time to full time), job share schemes, flexible start and finish times (flexitime), ability to change shift patterns, compressed hours (e.g. 4½ day week), and night working (management survey only). We initially consider the six arrangements which seem most likely to facilitate caring activity – working at home, reductions in hours, job share, flexitime, changing shift patterns and compressed hours – before narrowing the focus to those practices which are found to be significantly associated with informal caring.

Table 1 summarises the management and employee responses to the flexible work questions. According to the employee reports (column (1)), availability of flexible working ranges from about 15% of workers for the option of working at home to nearly 40% for flexitime. The next two columns of the table summarise the management responses: column (2) reports proportions of workplaces with flexible working, while column (3) weights these figures by the number of employees in each workplace to give overall proportions of workers with potential access to flexible working (these proportions are substantially higher than the workplace proportions in most cases, no doubt reflecting the well-documented fact that larger workplaces are more likely to offer flexible working arrangements; Hooker et al, 2007).

Table 1: Availability of flexible working practices

	Employees	Reports by: Management		Employees and management
	% employees covered	% workplaces covered	% employees in covered workplaces	% employees covered
	(1)	(2)	(3)	(4)
Flexitime available	38.0	36.4	43.3	22.4
Can reduce work hrs	31.6	64.0	80.6	27.8
Can work at home	14.1	25.6	38.4	9.9
Job share available	18.7	26.6	46.3	11.9
Can change work pattern	27.5	41.5	54.7	19.0
Can work compressed wk	19.9	11.4	25.1	7.7
Observations	18555	1589	1589	18555

Notes: estimates are weighted to account for: sample design and selection at employee level (columns (1) and (4)); sample design (column (2)); sample design and number of employees in each workplace (column (3)).

Managers were asked to report whether flexible working was used by *any* employees in the workplace, so it is not surprising that the figures in column (3) are larger than the proportions as reported by workers.[8] For example, 81% of employees are in workplaces offering reduced working hours according to managers, while only 32% of employees report having access to reduced working hours. There is also evidence that workplace-level policies on flexible working may not in fact be implemented at lower levels of the organisation or employees may not be aware of flexible working options (see Budd and Mumford, 2006; Nadeem and Metcalf, 2007). There are also workers who report access to flexible working when the management respondent states that that particular arrangement is not used in the workplace. An explanation for this is that supervisors or more junior managers may allow informal flexible working even when there is no official policy (Yeandle et al, 2006). To deal with these issues, we use two flexible working variables: the first (column (1)) includes any flexible working reported by employees (which should include informal flexible working) while the second (column (4)) only includes flexible working reported by employees if the manager also reports that flexible working is offered in the workplace.

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[8] For two of the practices (reduced working hours and flexitime), managers were asked whether these arrangements were available to all employees or restricted to some groups only (e.g. employees with children, those with caring responsibilities, and non-managerial staff). By matching these answers to employee characteristics, it is possible to observe within-workplace variation in access to flexible work. In practice, the amount of within-workplace variation is limited and instead we use employees' own responses. We examine the importance of within-workplace variation in Section 6.

4.2 Informal care

Table 2: Informal care among men and women (%)

Hours of informal care	Men		Women		All	
None	86.7		83.1		84.9	
0-4 hours per week	6.6	*49.6*	7.3	*43.2*	6.9	*45.7*
5-9 hours per week	3.0	*22.6*	4.4	*26.0*	3.7	*24.5*
10-19 hours per week	1.5	*11.3*	2.0	*11.8*	1.8	*11.9*
20-34 hours per week	0.5	*3.8*	0.9	*5.3*	0.7	*4.6*
35 or more hours per week	1.6	*12.0*	2.3	*13.6*	2.0	*13.2*
Total	100.0	*100.0*	100.0	*100.0*	100.0	*100.0*
Observations	8743		9812		18555	

Notes: (1) estimates are weighted to account for sample design and selection at employee level.
(2) Figures in italics are proportions of carers (employees with positive care hours).

Table 2 summarises the amount of informal care reported by employees in answer to the question: "Do you look after or give help or support to any family members or friends who have a long-term physical or mental illness or disability, or who have problems related to old age?" Positive amounts of informal care were reported in five bands. Overall, about 15% of employees reported providing some informal care, most of which is fairly 'light': slightly under half of carers (6.9% of employees) provided 4 or fewer hours per week, and just under a quarter (3.7% of employees) provided 5–9 hours of care. Some 30% of carers provided 10 hours or more, and 18% of employees reported being intensive carers (20 or more hours per week). While it is not true that all carers are women, they are significantly more likely to care than men (17% compared to 13%), and female carers are also less likely than men to report very low hours of care (less than 5 hours). Both the levels of overall care and the gender gap are similar to those from other data sources, including the 2001 Census (reported in Yeandle et al, 2006: overall caring rates were about 3% points lower, but included employees in workplaces with less than 5 employees) and the British Household Panel Survey (BHPS).

5. Econometric framework

The empirical analysis is based on a reduced-form equation that models care among employees as a function of (a) characteristics that influence the supply of care and (b) measures of access to flexible working. A more structural approach is not feasible as it would impose identification requirements which are difficult to achieve with the data available. The first is that for some workers, there will be no effect on care provision either because they do not give any care, or because the amount of care is low enough to fit in with work commitments (in other words, the flexible work constraint does not bind). Other workers will be constrained in the amount of care they provide by the lack of flexible work. A structural approach would allow for both constrained and unconstrained 'regimes' of care provision, and evaluate the effect of access to flexible work on time constraints. Since the data do not include information about whether individuals' work commitments prevent them from providing as much care as they would like, this approach is not feasible. In the reduced-form approach, the impact of access to flexible work on care should therefore be interpreted as a average effect on the whole population of workers and not just those who are constrained.

The second issue is that the sample will under-represent intensive carers who are unable to work because of their care commitments. Again, identification is problematic because WERS only includes employed workers, and so without strong assumptions it is not possible to estimate the effect of selection out of the sample due to care. Because of this selection, the estimated coefficient on flexible work will combine two distinct effects: (i) the effect on the care hours of existing workers and (ii) the effect on average care hours owing to any increased employment among carers. As already noted, research into the effect of care on employment suggests that only high levels of care (typically more than 20 hours per week) have a substantial effect of employment probabilities. Selection is therefore most likely to thin out the density of observed care hours at high levels. In Section 6.4, we specifically investigate the heterogeneous effects of flexible work across the care hour distribution.

As seen in Section 4, the dependent variable is banded rather than continuous and so ordinary least squares regression is not appropriate. Instead we use ordered

probit techniques to model the probability of care hours falling into each of the six different bands. An extension of the ordered probit, interval regression, would also be possible (Wooldridge, 2002, pp508–9) but interval regression makes stronger distributional assumptions (which are rejected by diagnostic tests). Furthermore, the ordered probit is readily adapted to estimate heterogeneous effects across the hours bands, and can also be extended to allow for endogenous flexible work (using a bivariate ordered probit). The ordered probit assumes there is a latent variable y_i^*, for individual i, which determines the response category according to its value relative to a set of cutpoints:

$$y_i = k \text{ if } \mu_{k-1} < y_i^* \leq \mu_k, \ \ k = 1, \ldots, 6$$

where $\mu_1, \ldots, \mu_5$ are cutpoints to be estimated (and $\mu_0 = -\infty$, $\mu_6 = +\infty$).

The latent variable is modelled as:

$$y_i^* = \mathbf{x}_i\boldsymbol{\beta} + \varepsilon_i, \quad \varepsilon_i|\mathbf{x}_i \sim N(0, 1)$$

where $\mathbf{x}_i$ is a vector of determinants of care hours, including the flexible work availability, and the coefficients of interest to be estimated are the vector $\boldsymbol{\beta}$. Assuming the error term ε is normally distributed, we can write down the probability of observing category k as:

$$\Pr[\mu_{k-1} < y_i^* \leq \mu_k] = \Pr[y_i^* \leq \mu_{k-1}] - \Pr[y_i^* \leq \mu_k] = \Phi(\mu_k - \mathbf{x}_i\boldsymbol{\beta}) - \Phi(\mu_{k-1} - \mathbf{x}_i\boldsymbol{\beta})$$

where $\Phi(.)$ is the standard normal cumulative density function.

We can view y^* as being some (unknown) monotonic transformation of underlying desired hours h^{c*}, i.e. $y^* = g(h^{c*})$. This makes the model more flexible than interval regression, which assumes that $h^{c*}|\mathbf{x}$ is normally distributed (and takes the cut-points as given by the hours band intervals). By contrast, the ordered probit allows $h^{c*}|\mathbf{x}$ to be non-normally distributed and instead models the normally distributed transformed variable.[9] In practice the ordered probit and interval regression give similar results, though statistical tests favour model tests favour the ordered probit.

Some attention is needed in interpreting the estimates. The $\boldsymbol{\beta}$ coefficients give the marginal effect of $\mathbf{x}$ on y^*, but we are more interested in the marginal effect on actual hours of care (either including or excluding zero hours) or on the probability of being a carer. The probabilities and marginal effects associated with each hours band are easily calculated using the formulae above, and can be expressed in terms of

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[9] The cutpoints need to be estimated in the ordered probit since $\mu_k = g(a_k)$, where a_k are true hours cutoffs, and $g(.)$ is unknown.

expected hours by multiplying by the mid-points of the bands (see section 6.2). The coefficients only have a strictly casual interpretation if the determinants of care in **x** (in particular, for our purposes, the flexible work measures) are not correlated with the unobserved determinants of care included in ε. Measures of *access* to flexible work are less likely to be correlated with ε than take-up of flexible arrangements (which is clearly jointly determined with care). (Furthermore, the impact of access to flexible work, which can be legislated for, is arguably more relevant to policy than take-up.) Nevertheless, access to flexible work may still be endogenous if carers sort into workplaces offering flexible arrangements, or if firms respond to the presence of carers by providing flexible work. Therefore the baseline estimates should be considered as associations rather than causal effects. We consider the possible channels that might explain these associations in detail in Section 6.5.

6. Results

6.1 Model of care hours

We now present (in Table 3) the ordered probit estimates of the basic care supply equation (omitting any flexible work measures). The model was estimated by maximum likelihood and standard errors allow for the clustering of individuals within workplaces. The explanatory variables are a set of individual characteristics expected to influence the supply of care hours: age, gender, marital status, presence of children of different ages, ethnic group, log hourly wage, and highest educational qualification. Rather than estimating separate equations for men and women, we allow for a gender-specific intercept and interactions. We dropped insignificant interactions during pre-testing, so the final model includes interactions of female gender with marital status and education levels. It turns out, see below, that the effect of flexible work does not differ across gender.

The estimates in the table are the raw probit coefficients, which we present to examine the broad patterns in the determinants of care hours. We focus on the marginal effects in specific cases below when we consider the effect of flexible working. As expected from previous research (Yeandle et al, 2006), informal care is strongly related to a person's age. All else constant, the number of hours of informal care peaks in the 50-59 year age group. The coefficient on the dummy variable for women is not significant, and the married/cohabiting coefficient is not significant,

however the interaction of the two is highly significant. This implies that single women do not provide more care than men (married or single), but that married women provide more care than both groups. Some previous studies have found that single individuals give more care than married people (see the survey in Henz, 2006). However, marriage also increases the potential demand for care, both from the spouse and in-laws, and this effect seems to dominate in this sample of employees.

Table 3: Supply of informal care hours

Explanatory variable	Coefficient (*t*-stat)	Explanatory variable	Coefficient (*t*-stat)
Female	-0.062	Log(hourly wage)	-0.069***
	(-0.94)		(-3.07)
Aged 22-29 yrs	0.073	CSE or other quals	0.055
	(1.13)		(1.00)
Aged 30-39 yrs	0.238***	O levels	0.039
	(3.72)		(0.73)
Aged 40-49 yrs	0.567***	A levels	-0.017
	(8.67)		(-0.29)
Aged 50-59 yrs	0.782***	First/higher degree	-0.138***
	(12.36)		(-2.64)
Aged 60+ yrs	0.601***	Female * CSE	0.075
	(7.53)		(1.02)
Married/cohabiting	-0.016	Female * O levels	0.113*
	(-0.41)		(1.68)
Female * married	0.161***	Female * A levels	0.104
	(3.25)		(1.37)
Has kids 0-4 years	-0.100**	Female * degree	0.181***
	(-2.41)		(2.62)
Has kids 5-11 yrs	0.039	Cutpoint 1	1.379***
	(1.22)		(17.32)
Has kids 12-18 yrs	0.081***	Cutpoint 2	1.777***
	(2.83)		(22.00)
Black	0.000	Cutpoint 3	2.095***
	(0.00)		(25.64)
Asian	0.272***	Cutpoint 4	2.341***
	(4.30)		(28.24)
Chinese/mixed race	-0.027	Cutpoint 5	2.474***
	(-0.19)		(29.80)
N	18555	Log-likelihood	-11743.3

Notes: (i) the dependent variable is the number of hours of informal care per week, banded into six categories: zero hours, 0–4 hours, 5–9 hours, 10–19 hours, 20–34 hours, 35+ hours; (ii) model estimated using ordered probit, with standard errors adjusted for clustering of workers within workplaces; (iii) *t*-statistics in parentheses; (iv) * significant at 10%; ** significant at 5%; *** significant at 1%

Preschool children are associated with less informal care, while teenage children are associated with more. Again, there is no consensus on the effects of

children in the literature, but older children may increase care provision if they can relieve carers of household chores. The wage coefficient is negative and statistically significant, which is consistent with a substitution effect: a higher wage increases the opportunity cost of providing informal care. All else constant, only degree-level qualifications have an effect on care: they reduce care provided by men, and slightly increase care provided by women, holding the wage constant.

6.2 Impact of access to flexible working on care hours
We next introduce the measures of flexible working availability into the model. Recall that we use two alternative sets of measures: first, based on workers' reports only and second, workers' reports corroborated by managers' reports. There are six possible flexible work arrangements (see Table 1), however they are strongly correlated with one another: workplaces providing one flexible arrangement are more likely to provide other arrangements too. One way to deal with this issue would be to combine the arrangements into a single index or extract a common factor from the six measures. Unfortunately, this would not allow us to examine any distinct effects due to the type of flexible working offered. We therefore kept the measures separate in initial investigations.

First, we estimated the care hours model, introducing each flexible working practice separately. Two of the arrangements (changed working patterns and working at home) showed no significant relationship with informal care, and so we next we estimated a model including the remaining four flexible working practices. The results are presented in Table 4, column (1) for the worker reports, and column (4) for the worker/management reports. This model shows that, allowing for independent effects of the four practices, only flexitime and reduced working hours show up as statistically significant. These two measures can be seen as representing two distinct dimensions of flexibility: the ability to adjust the timing of work and the ability to reduce the total amount of work. In columns (2) and (5), we retain only these two flexible work measures. Equality of the two coefficients in each model cannot be rejected, so our final baseline model (columns (3) and (6)) includes an ordered categorical variable giving the number of flexible practices (zero if neither flexitime nor reduced hours is available, 1 if one of them is available and 2 if both practices are available). The remainder of the paper uses this baseline specification, but we

disaggregate the summary indicator as appropriate to test for distinct effects of flexitime and reduced hours working.

Table 4: Association of access to flexible working with care hours

Availability of:	Worker reports			Worker/management reports		
	(1)	(2)	(3)	(4)	(5)	(6)
Flexitime	0.050**	0.049**		0.049	0.051*	
	(1.98)	(2.00)		(1.64)	(1.78)	
Reduced hours	0.054**	0.050**		0.054**	0.058**	
	(1.99)	(1.98)		(2.01)	(2.21)	
Compressed wk	0.006			0.013		
	(0.21)			(0.31)		
Job share	-0.018			0.009		
	(-0.58)			(0.24)		
No. of flexible arrangements			0.050***			0.055***
			(3.24)			(3.16)
N	18555	18555	18555	18555	18555	18555

Notes: (i) see notes to Table 3; (ii) controls also included are: log hourly wage and dummy variables for gender, five age groups, marital status, dependent children in three age groups, ethnic group, and highest qualification; and interactions of gender with marital status and qualification; (iv) *t*-statistics in parentheses; (v) * significant at 10%; ** significant at 5%; *** significant at 1%

To assess the substantive importance of these effects, Table 5 presents predictions of the probability of caring (i.e. care hours greater than zero) and the expected number of care hours among carers (i.e. conditional on care hours being greater than zero), taken from the model using worker reports (column (3) in Table 4). The table compares a scenario without flexible working to a scenario in which either flexitime or reduced hours are available. Predictions are made for a specific reference person (a married woman in her fifties with no dependent children, qualified to A-level, and earning the sample mean wage), and as well as for all individuals in the sample (and the average reported). The reference person is more likely than the average to be a carer (the probability of caring without flexible working is 0.27 compared to 0.15 on average) and, if a carer, the expected number of care hours is higher (4.6 hours against 2.1 hours). Having access to either flexitime or reduced hours is associated with an increase in the probability of being a carer of 1.7 percentage points for the reference person and 1.2 percentage points on average. These absolute effects equate to a proportionate increase in the probability of caring of some 6-8%. Access to flexible working is associated with an increase of 0.5 hours of care for the reference person (assuming she cares) and 0.25 hours among carers on average. These effects corresponds to a increase of just over 10% in the expected

number of hours, suggesting a moderate effect of flexible working in relaxing the constraints that hinder workers in providing informal care. The remainder of the paper looks into whether this effect differs across the distribution of work and care hours, and investigates the mechanisms which might lie behind this association, paying attention to possible non-random sorting of workers into workplaces and reverse causality.

Table 5: Predicted impact of flexible working on care hours

	Reference person		Sample average	
	Pr(caring)	E(hours|caring)	Pr(caring)	E(hours|caring)
No flex work practices	0.267	4.60	0.151	2.06
1 flex work practice	0.284	5.12	0.163	2.31
Difference	0.017	0.52	0.012	0.25

Notes: (i) predictions are derived from model (3) in Table 3; (ii) reference person is a woman is aged 50-59, married with no dependent children, has A-levels and earns the sample mean wage (£8.85/hr); (iii) sample average is mean of predictions across all individuals in sample; (iv) expected care hours are calculated by assigning the midpoint to each hours band (assuming a mean of 40 hours in the 35+ hours category).

6.3 Differences in impact of flexible working across full-time/part-time status

Previous studies have suggested that the trade-off between employment and care is more acute at high intensities of work and, especially, care (e.g. Carmichael and Charles, 2003). Little is known about how flexible work moderates the trade-off at different work and care intensities, though it has been suggested (e.g. Henz, 2006) that flexible working might be most helpful in facilitating small amounts of care. The next two sub-sections investigate heterogeneous effects of flexible work across the work and care hours distributions.

We first look at working hours, distinguishing between part-time work (30 hours or less per week), 'standard' full-time hours of up to 48 hours per week, and long hours working (more than 48 hours). We also separate flexible working into reduced hours working and flexitime. Since the first affects the amount of work and the second affects the distribution of work, they may interact with total working hours in distinct ways. Table 6 presents re-estimates of the care hours equations which now condition on work hours (standard full-time is the base category) and allow different

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effects of flexible working for part-timers and long-hours workers. The first two rows of the table show that part-time workers do more care than 'normal' full-timers but that long-hours workers do not do any less. The part-time finding is as expected from previous literature (Berecki-Gisolf et al, 2008), and if we consider part-time jobs as flexible, is evidence that the take-up of flexible work is associated with more informal care. However, it seems that long-hours working is no more restrictive for care than working standard full-time hours.

Table 6: Impact of flexible working on care hours by work hours

	Worker reports	Worker/management reports
	(1)	(2)
Part time (<=30 hours)	0.121***	0.141***
	(3.10)	(3.87)
Long hours (>48 hours)	-0.042	-0.040
	(-0.95)	(-1.01)
Flexitime available	0.033	0.042
	(1.08)	(1.23)
Part-time * flextime available	0.030	0.011
	(0.57)	(0.19)
Long hours * flextime available	0.085	0.105
	(1.07)	(1.02)
Can reduce work hrs	0.087***	0.103***
	(2.70)	(3.11)
Part-time * can reduce work hours	-0.106*	-0.138**
	(-1.95)	(-2.51)
Long hours * can reduce work hours	-0.155*	-0.116
	(-1.74)	(-1.24)
N	18555	18555

Notes: (i) see notes to Table 3; (ii) controls also included are: log hourly wage and dummy variables for gender, five age groups, marital status, dependent children in three age groups, ethnic group, and highest qualification; and interactions of gender with marital status and qualification; (iii) *t*-statistics in parentheses; (iv) * significant at 10%; ** significant at 5%; *** significant at 1%

The interactions show that flexitime does not have a different effect among part-timers or long-hours workers (although with the extra interactions, the main flexitime effect is no longer significant). But we see some evidence that the ability to reduce hours is more effective among full-timers, since the interaction of reduced hours availability and part-time working is negative (and even somewhat larger than the main effect). The long-hours interaction is also negative, though only marginally significant (and the only in the specification using worker reports). It may be that part-time jobs are already quite flexible, so that the additional option to reduce hours does

not make much difference, while long-hours working is too inflexible for a small reduction in hours to help much (or perhaps, these workers are too busy to reduce their hours). In both cases though, we should bear in mind that working hours are potentially endogenous, for example workers may choose a part-time job because they need that level of flexibility and long-hours workers may accept a heavy work load as a requirement when they take the job.

6.4 Different effects across care hours thresholds

To investigate whether there are heterogeneous effects of flexible working across the care hours distribution, the ordered probit model can be extended to allow the cutpoints themselves to be functions of observed characteristics and not just constants (see Terza, 1985):

$$\mu_k = \alpha_k + \mathbf{x}_i\boldsymbol{\delta}_k$$

where α_k is a constant and δ_k is a vector of coefficients. This allows for the possibility that changes in characteristics may increase or decrease the chances of changing categories by moving a particular cutpoint. Incorporating this new specification of the cutpoints into the probability of observing category k, we get:

$$\Pr[\mu_{k-1} < y_i^* \leq \mu_k] = = \Phi(\alpha_k - \mathbf{x}_i\boldsymbol{\beta}_k) - \Phi(\alpha_{k-1} - \mathbf{x}_i\boldsymbol{\beta}_{k-1})$$

where a separate set of coefficients $\boldsymbol{\beta}_k$ is estimated at each cutpoint.

Table 7 reports the coefficients on the availability of flexitime and reduced hours working (entered separately to allow for different impacts), with a test of equality across the five thresholds. Equality is rejected at the 5% level for the coefficients on flexitime, but not for the reduced hours coefficients (although their magnitudes are largest at the two lower thresholds). The sizes of the flexitime coefficients (especially when using the worker/management reports) suggests that flexitime increases the chances of becoming a carer, and of providing small amounts of care, but does not affect the provision of large amounts of care. Although the evidence is only tentative, this does suggest that more flexible working would not help reconcile work and care for those with large care burdens.

Table 7: Impact of flexible working on care hours across thresholds – generalised ordered probit models

Threshold	Worker reports		Worker/management reports	
	Flexitime	Reduced hrs	Flexitime	Reduced hrs
0 hours	0.053**	0.055**	0.068**	0.062**
5 hours	0.016	0.052*	-0.002	0.061**
10 hours	0.065*	0.032	0.022	0.052
20 hours	0.065	0.014	0.029	0.027
35 hours	0.015	0.041	-0.018	0.039
Equal coeffs, $\chi^2(4)$ [p-value]	10.02 [0.04]	2.02 [0.72]	10.04 [0.04]	1.11 [0.89]

Notes: (i) the dependent variable is the number of hours of informal care per week, banded into six categories: zero hours, 0–4 hours, 5–9 hours, 10–19 hours, 20–34 hours, 35+ hours; (ii) standard errors adjusted for clustering of workers within workplaces; (iii) controls also included are: log hourly wage and dummy variables for gender, five age groups, marital status, dependent children in three age groups, ethnic group, and highest qualification; and interactions of gender with marital status and qualification; (iv) * significant at 10%; ** significant at 5%; *** significant at 1%

6.5 Mechanisms behind the relation between flexible work and informal care

The analysis thus far has uncovered a modest association between access to flexible working and informal care, with evidence that the option to reduce working hours has the largest effect for 'standard' full-time workers and that flexitime is most effective in facilitating small amounts of care. A first interpretation of this relationship (consistent with the model presented in Section 3) is that access to flexible work relaxes a person's time constraints and allows them to increase the amount of care being provided to the dependent, or to substitute for care previously provided by another person. This is a convenient interpretation of the results from a policy point of view because it tells us the extent to which an expansion of access to flexible work would facilitate informal care provision. Nevertheless, we need to be careful in interpreting the results as a clean casual relationship from flexible work to care, because other mechanisms may be at work. First, when the need for care arises, workers may consciously sort into jobs that provide flexible working, which would give rise to a positive association between flexible work and care even though access to flexible working does not raise the amount of care provided. To test for this mechanism we restrict the estimating sample to workers with at least 5 years of job tenure, thus eliminating any short-term job changes by workers as care needs arise.

A second mechanism is that people with a caring burden may be attracted into flexible jobs because of an broader environment that is conducive to combining work

with care (e.g. less pressured working conditions). A related possibility is that informal carers are more 'pro-social' and therefore attracted to the 'mission' of public sector organisations (Besley and Ghatak, 2003). Since the public sector is known to offer more flexible work (Hooker et al, 2007), this could yield a positive estimated relationship between caring and flexible work. Gregg et al (2008) provide evidence that workers who behave pro-socially (by working unpaid overtime) tend to be selected into public sector organisations, and it is plausible that a similar selection process operates for informal carers.

To allow for a general association of workplace conditions with informal care, we can rewrite the care equation to include a workplace effect $u_{j(i)}$:

$$y_i^* = \mathbf{x}_i\boldsymbol{\beta} + u_{j(i)} + \varepsilon_i,$$

where $j(i)$ refers to workplace j employing worker i. We represent $u_{j(i)}$ in two ways: first using a set of workplace observed workplace characteristics, such as public sector affiliation, industry and measures of workforce composition; and second, in the spirit of correlated random effects models used for panel data (see Mundlak, 1978), we model $u_{j(i)}$ as a linear combination of the mean values of $\mathbf{x}$ in each workplace.[10] A caveat to both these methods is that if there is sorting into, say, industries or firms based on access to flexible working then workplace characteristics are endogenous. The result will be to overstate the effect of workplace characteristics and understate the effect of the $\mathbf{x}$ variables. In this case, the flexible work coefficients could be seen as lower bounds on the true effect.

A final mechanism is that firms may respond to the presence of carers in the workforce (and a demand for family-friendly arrangements) by providing flexible working, thus the causality between flexible work and caring is reversed. We allow for this possibility in two ways. First, we proxy the demand for flexible working in a workplace by including in the equation the proportion of carers in the workplace (calculated over all observed workers except the individual being modelled). Second, we pursue a more conventional strategy to endogenise flexible work, by modelling access to flexible working jointly with the model of care hours, in a bivariate ordered probit framework (3 categories for flexible work, 6 categories for care hours). A key

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[10] Modelling $u_{j(i)}$ using conventional random-effects or multilevel models is not appropriate because this would assume that $u_{j(i)}$ is uncorrelated with $\mathbf{x}_i$.

requirement for identifying the causal effect of flexible work on care is that some variables (instruments) affect access to flexible work but not care (and so are validly excluded from the care hours equation). Candidate variables are those which change the cost to firms of providing flexible working or, say, reflect a management ethos regarding work-life balance. After some pretesting of instrument sets, the following variables were chosen as instruments: workplace age, daily and weekly workplace operating times (dummy variables for operating a 6/7 day week, working a 24-hour schedule and operating outside normal daytime hours) and the management representative's attitude to work-life balance (strength of agreement that it is up to individual employees to balance work and family life).[11]

The results of these different specifications are presented in Table 8. The first row shows that little change in the coefficients compared to the baseline specification in Table 4, when estimation is restricted to workers with at least 5 years' job tenure. Thus there is no evidence that the association between flexible work and care is driven by workers who switch to flexible jobs in the short or medium-term to provide care. The next two panels provide some evidence about longer-term selection mechanisms. In the second panel, we add workplace controls: proportions of women, PT workers, and workers over 50; and dummy variables for one-digit industry and public sector status. After controlling for workplace heterogeneity the flexible work coefficients are substantially reduced (and only significant when using worker reports of flexible work). In the third panel, we model workplace heterogeneity using the mean characteristics of the (sampled) workers in each workplace, reporting the coefficients on the number of flexible arrangements available to a worker and the mean number reported per workplace. Only the workplace mean coefficient is significant (and is about double the size of the previously estimated worker-level coefficient).

Taken together, the results from panels 2 and 3 suggest that the wider working environment (as proxied by workplace characteristics) seems to matter for care provision; indeed, the availability of flexible work at the workplace level, as captured

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[11] The other instruments considered were workplace size, occupational composition, union density; experiments with linear instrumental variable methods, using the Sargan test of instrument validity, indicated that they could not be excluded from the care hours equation.

by the mean number of flexible practices reported by employees (and which may also reflect a broader flexible culture) seems to be more important than any additional flexibility at the individual job level. However, as noted above, workplace characteristics are arguably endogenous in the care equation and absorb some of the effect that should be attributed to flexible work. Owing to this risk of 'over controlling' for workplace characteristics, the worker-level effect of flexible work in panels 2 and 3 could be seen as lower-bound estimates.

Table 8: Impact of flexible working on care hours: investigating selection, sorting and reverse causality

Sample / specification		Worker reports	Worker / management reports
1. Workers with at least 5 years' tenure only		0.043**	0.059**
($N = 8122$)		(1.97)	(2.44)
2. Controlling for workforce composition and industry		0.039**	0.033
($N = 18555$)		(1.99)	(1.45)
3. Controlling for mean	# flex arrangements	0.019	-0.006
characteristics		(1.07)	(0.29)
within workplace	W/place mean # flex	0.096***	0.136***
($N = 18555$)	arrangements	(2.83)	(3.95)
4. Controlling for proportion of other carers in w/place		0.044***	0.045***
($N = 18508$)		(2.98)	(2.78)
5. Controlling for prop of other carers (10+ obs only)		0.042***	0.041**
($N = 15291$)		(2.61)	(2.37)
6. No. of flexible arrangements endogenised		0.207	0.278**
($N = 18555$)		(1.50)	(2.27)

Notes: (i) see notes to Table 3; (ii) controls also included are: log hourly wage and dummy variables for gender, five age groups, marital status, dependent children in three age groups, ethnic group, and highest qualification; interactions of gender with marital status and qualification; (iii) workforce composition variables are proportions of women, PT workers, and workers over 50; industry controls public sector status; (iv) mean characteristic controls included in third panel are within-workplace means of individual characteristics listed in (ii); (v) additional instruments in bottom panel are: workplace age, management attitude to WLB, and dummy variables for operating 6/7 day week, 24-hour schedule and outside normal hours. (vi) *t*-statistics in parentheses; (vii) * significant at 10%; ** significant at 5%; *** significant at 1%

Finally, we look at possible reverse causality. The fourth panel of Table 8 presents the estimates when the demand for flexible work is proxied by the proportion of carers in the workforce. Since this proportion is calculated from individual worker responses, it may not be reliable if only a few workers are observed in a workplace. We therefore also report estimates from a subsample containing at least 10 observed workers per workplace. The two sets of results are almost identical and are very

similar to the baseline estimates in Table 4, indicating that the positive association between flexible work and care does not arise because workplaces with many carers provide flexible work for them. Finally, the bottom panel of the table shows the results from the bivariate ordered probit model which endogenises access to flexible work. The impact of flexible work on care is large and significant: the interpretation is that workplaces with lower costs of providing flexible work, or a management ethos in favour of helping employees with work-life balance, offer more flexible practices and this in turn leads to more caring among the workforce. The coefficients in this model are large (five times the baseline estimates) and are somewhat sensitive to the choice of instrument set so we do not emphasise these results.[12] But taken together with the estimates controlling for the proportion of carers, we conclude that workplaces do not react to the presence of carers by offering flexible work.[13]

7. Conclusions

Previous research into employment and informal care has mostly concentrated on the extensive work margin – does care reduce labour market participation and does working reduce the amount of care given? This paper has looked inside the job to investigate the association between access to flexible working and the amount of care provided. Out of a range of flexible working practices we find that two – flexitime and the ability to reduce working hours – are each associated with about 10% more hours of informal care. The ability to reduce working hours appears to facilitate care mainly among full-time workers, probably because part-time work already provides enough flexibility. Meanwhile, flexitime seems to help with small amounts of care but does not affect the care provided by intensive carers. These two findings are consistent with previous research that the main conflict between work and care is when individuals do large amounts of both, though they also suggest that flexitime may only be of limited use in alleviating this conflict.

The results also indicate that workplace factors beyond the formal provision of flexible work appear to favour the combination of work and care, and that flexible

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[12] The correlation between the error terms of the two ordered probits in the bivariate model is not significant, indicating that access to flexible work is exogenous. The preferred model is thus the baseline ordered probit model, assuming flexible work to be exogenous.
[13] Note that neither strategy rules out sorting of carers to workplaces that offer flexible work, because the controls and instruments are at the workplace level.

work policies at the workplace level are more important than additional flexibility at the individual job level. We have ruled out that workplaces provide flexible work in response to a demand for family-friendly working by carers in the workforce, instead there is some evidence of a long-term sorting process of workers who care (or expect to care) into flexible workplaces. The policy impact of an expansion of flexible work may not be a large as suggested by the baseline estimates because of this selection process. We also do not know from our data whether, for instance, an increase in care by one household member would be accompanied by a reduction by another household member. Overall, the results suggests that while flexible work makes a small contribution to reconciling work and care, it is unlikely to have a substantial effect on the amount of care provided, or to encourage labour market participation by non-working intensive carers.

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Appendix A

1. Informal care question

Employee respondents are asked:

"Do you look after or give help or support to any family members or friends who have a long-term physical or mental illness or disability, or who have problems related to old age?"
No
Yes, 0 – 4 hours a week
Yes, 5 – 9 hours a week
Yes, 10 – 19 hours a week
Yes, 20 – 34 hours a week
Yes, 35 or more hours a week

2. Flexible work questions

Employee respondents are asked:

"If you personally needed any of the following arrangements, would they be available to you?" [Yes, no, don't know]
Flexi-time
Job sharing (sharing a full-time job with someone else)
The chance to reduce your working hours (eg full-time to part-time)
The chance to increase your working hours (eg part-time to full-time)
Working at or from home in normal working hours
Changing working patterns including shifts
Working the same number of hours per week across fewer days (eg 37 hours in four days instead of five).

Management respondents are asked:

"Now I'd like to ask you about the different types of flexible working, leave and childcare arrangements which some employers provide their employees to help them to balance their work and home lives.
"Looking at this card, do you have any of the following working time arrangements for any employees at this workplace?"
1) Working at or from home in normal working hours,
2) Ability to reduce working hours (e.g. switching from full-time to part-time employment),
3) Ability to increase working hours (e.g. switching from part-time to full-time employment),
4) Job sharing schemes (sharing a full-time job with another employee),
5) Flexitime (where an employee has no set start or finish time but an agreement to work a set number of hours per week or per month),
6) Ability to change shift patterns,
7) Working compressed hours (e.g. a 9 day fortnight / 4½ day week),
8) Night working,
9) None of these"

Table A.1: Definitions of variables

Variable	Definition	WERS questionnaire	WERS variable(s)
Hours of informal care	Ordered categorical variable indicating amount of weekly informal care in five bands: none, 0-4, 5-9, 10-19, 20-34, 35 or more hours.	SEQ	E5
Availability of flexible work (worker reports)	Six dummy variables (not mutually exclusive) equal to 1 if worker reports that flexible work practice available and 0 otherwise. Practices are: flexitime, reduced work hours, working at home, job share, changed work pattern, compressed working week.	SEQ	B1
Availability of flexible work (worker and management reports)	Six dummy variables (not mutually exclusive) equal to 1 if both worker and management report that flexible work practice is available and 0 otherwise. Practices are: flexitime, reduced work hours, working at home, job share, changed work pattern, compressed working week.	SEQ, MQ	B1, IFLEX
Female	Dummy variable equal to 1 if female and 0 otherwise	SEQ	E1
Age	Six dummy variables equal to 1 if in age category and 0 otherwise. Categories are: 16-21, 22-29, 30-39, 40-49, 50-59 and 60+ years	SEQ	E2
Log wage	Log of gross hourly wage. Wage = usual gross earnings per week / usual weekly hours including overtime. Usual gross earnings per week are midpoints of reported earnings bands (using £25 for <£50 band and £1000 for >£870 band)	SEQ	A3, E15
Part-time	Dummy variable equal to 1 if usual weekly hours (including overtime) are 30 or less, and 0 otherwise.	SEQ	A3
Long hours	Dummy variable equal to 1 if usual weekly hours (including overtime) are more than 48, and 0 otherwise.	SEQ	A3
Highest academic qualification	Five dummy variables equal to 1 if qualification is highest and 0 otherwise. Derived from reports of all academic qualifications held. Categories are: No academic qualifications, GCSE D-G or equivalent, GCSE A-C or equivalent, A-levels or equivalent, first or higher degree.	SEQ	E7

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Table A.1 continued

Variable	Definition	WERS questionnaire	Variable(s)
Married or cohabiting	Dummy variable equal to 1 if married or living with a partner and 0 otherwise.	SEQ	E3
Children in age groups	Three dummy variables equal to 1 if has any dependent children in age group and 0 otherwise. Groups are: 0-4, 5-11 and 12-18 years.	SEQ	E4
Ethnicity	Four dummy variables equal to 1 if member of ethnic group and 0 otherwise. Groups are: white; Asian or Asian British (or mixed white and Asian); black or black British (or mixed white and black); and Chinese, other ethnicity or other mixed race.	SEQ	E14
SIC 2003 industry section	Twelve dummy variables equal to 1 if workplace belongs to industry and 0 otherwise. Industry sections are Manufacturing (D), Electricity, gas & water supply (E), Construction (F), Wholesale and retail (G), Hotels and restaurants (H), Transport, storage & communication (I), Financial intermediation (J), Real estate, renting & business (K), Public administration & defence (L), Education (M), Health and social work (N), Other community, soc & pers services (O). [WERS does not cover Sections A to C (Agriculture, hunting and forestry; Fishing; and Mining and Quarrying), P (Private households with employed persons) and Q (Extra-territorial bodies).]	SEQ	ASIC2003
Public sector	Dummy variable equal to 1 if workplace belongs to public sector and 0 otherwise.	MQ	ASTATUS1
Proportion of women in establishment	Proportion of women in establishment, derived from employee numbers reported by management.	EPQ	ZTOTWOM, ZALLEMPS
Proportion of PT workers in establishment	Proportion of part-time employees (less than 30 hours per week) in establishment, derived from employee numbers reported by management.	EPQ	ZALLPTE, ZALLEMPS
Proportion of workers aged 50+ in establishment	Proportion of employees aged 50 or over in establishment, derived from employee numbers reported by management.	EPQ	Z50PLUS, ZALLEMPS

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Table A.1 continued

Variable	Definition	WERS questionnaire	Variable(s)
Proportion of union members in establishment	Proportion of employees in establishment who are members of a trade union or independent staff association, derived from employee numbers reported by management.	EPQ	ZUNIMEM, ZALLEMPS
Workplace operating days	Two dummy variables equal to 1 if operating days are in category and 0 otherwise. Categories are: usually operates Monday-Friday and usually operates 6 or 7 days.	MQ	JUHOURS
Workplace operating times	Three dummy variables equal to 1 if operating times are in category and 0 otherwise. Categories are: usually operates 24 hours a day, usually operates any time between 8:00 and 18:30, and usually operates at some other time.	MQ	JUHOURS
Age of establishment	Number of years establishment in operation.	MQ	AHOWLONG, AHOWEST
Manager attitude to work-life balalance	Strength of agreement with: "It is up to individual employees to balance their work and family responsibilities". Scale is 1 to 5. 1 = manager strongly agrees that 5 = strongly disagrees.	MQ	APHRAS04

Note: Questionnaire source: SEQ = Survey of Employees Questionnaire, MQ = Management Questionnaire interview, EPQ = Employee Profile Questionnaire (completed by manager).

Table A.2: Means of variables

Variable	Individuals	Workplaces
Female	0.491	-
Aged 16-21 yrs	0.073	-
Aged 22-29 yrs	0.167	-
Aged 30-39 yrs	0.255	-
Aged 40-49 yrs	0.253	-
Aged 50-59 yrs	0.205	-
Aged 60+ yrs	0.046	-
Hourly wage (£)	10.774	-
Part-time	0.243	-
Long hours	0.117	-
No academic qualifications	0.170	-
GCSE D-G or equivalent	0.162	-
GCSE A-C or equivalent	0.259	-
A-levels or equivalent	0.147	-
First or higher degree	0.263	-
Married or cohabiting	0.666	-
Has children 0-4 yrs	0.123	-
Has children 5-11 yrs	0.188	-
Has children 12-18 yrs	0.198	-
White	0.937	-
Black or Black British	0.022	-
Asian or Asian British	0.033	-
Chinese or mixed race	0.007	-
Manufacturing	0.173	0.104
Electricity, gas & water supply	0.004	0.000
Construction	0.041	0.043
Wholesale and retail	0.153	0.252
Hotels and restaurants	0.040	0.073
Transport, storage & communication	0.064	0.051
Financial intermediation	0.056	0.044
Real estate, renting & business	0.151	0.149
Public administration & defence	0.054	0.025
Education	0.087	0.055
Health and social work	0.131	0.126
Other community, soc & pers services	0.046	0.076
Public sector	0.237	0.152
Proportion of women in establishment	0.487	0.548
Proportion of PT workers in establishment	0.253	0.335
Proportion of workers aged 50+ in estab	0.215	0.228
Proportion of union members in estab	0.274	0.163
Usually operate Mon-Fri	0.534	0.505
Usually operate 6 or 7 days	0.445	0.465
Usually operate 24 hours	0.301	0.117
Usually operate approx 8:00-18:30	0.510	0.660
Usually operate outside 8.00-18:30	0.189	0.222
Age of establishment (yrs)	42.976	35.509
Manager attitude to work-life bal (1-5)	2.603	2.400
Observations	18,555	1,589