



Quantifying Parental Childcare in the United Kingdom

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ABSTRACT

This paper presents a quantitative analysis of the total time that mothers and fathers spend with children aged 0-14 years in the United Kingdom. The aim of the paper is to obtain a comprehensive measure of parental time spent on childcare, via an innovative use of data from the United Kingdom Time-Use Survey 2000. The method sets co-presence (being with a child) as the basis of the total amount of care and examines activity diaries, eliciting three distinct states of being with a child, which depend entirely on what a parent records doing. These are 1) undivided care: time when a parent is recording a care activity as the sole primary activity, 2) combined care: time when childcare activities are combined with other activities and 3) non-specific care: time when a parent is with a child but not recording a specific childcare activity. The first two states are further investigated by examining specific care activities; the third state comprises the most significant quantity of time. I conduct descriptive, non-parametric and multivariate analyses on these three states. I find that differentiating between type of care activity and more general states of being with a child leads to a more comprehensive understanding of the determining factors of childcare time. I conclude that using co-presence as the basis of a measure of childcare more fully reflects the total time that parents spend looking after their children compared to focusing on specific childcare activities alone, potentially leading to a more accurate measure of the market value of this time.

NON-TECHNICAL SUMMARY

Time budget surveys have been the main source of information on the quantity of time that parents spend looking after their children. These surveys contain detailed information about the activities that a respondent engages in throughout a particular day. There is however an increasing awareness that focussing on childcare activities alone understates the total amount of time that parents can be said to be caring for their children. Time use surveys offer the potential to look at who people are with (co-presence) as well as what they are doing. Using information on co-presence, combined with information concerning the activities that parents record doing, this study develops a more comprehensive measure of the time that parents are caring for their children. In essence the basis of the measure of care in this study is proximity, substantiated by activity.

I argue that it is possible to identify three broad states of being with a child. These are:

1. **Undivided care:** time when a childcare activity is the sole activity
2. **Combined care:** time when childcare is combined with another activity
3. **Non-specific care:** time being with a child when no specific childcare activity is being carried out.

These states embody a diverse range of interaction between parents and children. It is possible to further elaborate on the first two of these states by looking at the specific childcare activities recorded by parents. This is carried out in detail. The third state comprises the largest body of time. Detailed analyses are carried out on these states with a view to building a consensus concerning a more expansive definition and measurement of childcare carried out by parents.

Using co-presence as the basis of the measure and looking at what parents are doing when with children a clear range of intensity of care emerged. Non-parametric and descriptive analysis showed that these states responded to variation in these variables in subtly different ways and the multivariate analysis provided more insight into the overall spectrum of care provided by mothers and fathers. This study adds to a

growing international literature, utilising British data in a comprehensive analysis of all the time parents spend caring for their children.

1. Introduction

Recent debates about an increasing need for childcare provision, associated with the increased labour force participation of women, have brought to the fore (albeit indirectly via concerns about cost), the potential market value of much of the work carried out by parents. This study aims to set the quantitative foundation of a comprehensive valuation of the time that parents spend looking after children. The valuation of childcare depends crucially on the price chosen and the quantity of care determined. The latter in turn depends on whether one is looking at the care from the perspective of the carer, or the child. In this paper childcare is looked at solely from the perspective of the carer. As such it forms the quantitative basis of an ‘input measure’ i.e. the value of the labour input into the provision.

Time budget surveys have been the main source of information on the quantity of time that parents spend looking after their children. These surveys contain detailed information about the principal (primary) activities that a respondent engages in throughout a particular day. Much of the research on childcare using time use studies has focused on specific childcare activities, and has provided insights into changes over time and comparisons across countries.¹ This is made possible by the reasonably high degree of comparability in activity codes across countries and through time.

There is, however, an increasing awareness that focussing on childcare activities alone understates the total amount of time that parents can be said to be caring for their children. Budig and Folbre (2004) argue that childcare is not just something parents do, but also a responsibility and a constraint permeating a parent’s entire day. It is argued that a continuum of care is provided by parents, from very intense or active care, to more passive less intense forms of care. In short, different forms of childcare can require varying degrees of a parent’s attention, from complete to cursory. How trends across space and time may be affected by expanded measures of childcare is not clear, but valuations of this time certainly will be affected.

¹ See Sayer, Bianchi & Robinson 2004; Gauthier, Smeeding & Furstenberg 2004; Gershuny 2000; Sandberg & Hofferth 2001.

This paper sets out a methodology for quantifying a comprehensive measure of childcare using time budget data. Time use surveys offer the potential to look at who people are with as well as what they are doing. Using information on co-presence, combined with information concerning the activities recorded by parents, this study develops a more comprehensive measure of the time that parents are caring for their children. In essence, the basis of the measure of care in this study is proximity, substantiated by activity. In valuing childcare provided by households, restricting estimates of the quantity of childcare to activities alone will result in an underestimate of the total value of this care. It is important therefore to estimate as fully as possible the different types and intensities of care, so as to get as accurate a value as possible.

I argue that it is possible to identify three broad states of being with a child. These are:

1. Undivided care: Time when a childcare activity is the sole activity,
2. Combined care: Time when childcare is combined with another activity
3. Non-specific care: Time being with a child when no specific childcare activity is being carried out.

These states embody a diverse range of interaction between parents and children. It is possible to further elaborate on the first two of these states in looking at the specific childcare activities recorded by parents. This is carried out in detail. The third state remains somewhat diffuse but constitutes the single largest body of time. Detailed descriptive, non-parametric and multivariate analyses are carried out on these states with a view to building a consensus concerning a more expansive definition and measurement of the childcare carried out by parents.

This paper is organised as follows. The following section introduces the data set, and discusses current themes in the area of quantifying childcare. Following from this in section three, the total time that parents spend with children is looked at within the context of all the activities that a parent engages in, and three states are delineated. These states are then described and subjected to non-parametric and descriptive analysis in section four. Two of these states are further investigated by examining

specific childcare activities in section five. Section six contains multivariate analysis of six models, five of which are nested within two of the states and the sixth represents the third state. Section seven concludes with a summary and discussion, looking at how results from this paper will inform work on the valuation of childcare provided by parents.

2. Quantifying Childcare: Data, Concepts and Methods

2.1 Data

The United Kingdom Time Use Survey 2000/01 (UKTUS) uses the most recent European model agreed for the design of the diary instrument, which is used to collect information about an individual's time use (EUROSTAT 2004). This diary instrument allows individuals to record their main or primary activity.² Respondents can also record what else they were doing. These are referred to as secondary activities, and the rationale behind including these in the diary instrument is to capture the real world situations whereby people are engaging in multiple tasks. Activities are recorded in the respondent's own words, and then professionally coded using a harmonised European framework.

Further to this, respondents could indicate who they were with throughout the day. There are six categories, and it is possible that a number of these boxes can be ticked at the same time. The information provided by this is often referred to as co-presence, or more generally, contextual data.³ For this chapter two of these six options are important: being with own household children aged 0 – 9 years, and/or being with own household children aged 10 – 14 years. This contextual data is of particular importance in this paper, as will be discussed below.

Diaries were required to be completed by respondents on one weekday and one weekend day. There are a total of 4946 diary days in the sample, with 996 fathers and 1374 mothers completing the two diaries, 64 fathers and 69 mothers completing a

² About 60% of respondents complete the diary now and then throughout the day or at the end of the day. A further 20% completed the diary the following day, and about 12% completed it a few days later. The remainder did not answer the question.

diary for a weekday only; and 26 fathers and 47 mothers completing diaries for a weekend only. This yields a total of 1086 fathers and 1490 mothers in the data set.⁴ The average age for men is 39 years and for women it is 36 years. There are 1539 households in this sample with 77.9% of these containing married/cohabiting couples. There are 332 lone parent households (21.6%) with the remaining 0.5% being of some other composition.

In all but the final multivariate analysis, day types (i.e. weekday versus weekend day) are looked at separately. The basic rationale for this comes from Yeung et al (2002) who argue that there is a stark difference in the quantity of care provided by fathers on a weekend compared to a weekday in the USA. There are of course obvious reasons for this, particularly relating to the employment of men and the educational commitments of children. Evidence for this in the UK will be examined throughout. All descriptive statistics reported are weighted using sample response weights.

2.2 Concepts: Defining Care

How childcare is defined ultimately determines estimates of the parental time input. Care can be understood generally as a feeling or a state of being; care can be a sense of concern or responsibility or we can talk of carefulness or attentiveness. Care can also be thought of as protection or supervision. As a verb, caring refers to activities associated with caring: tending to or minding. It can also refer to holding dear and loving. Childcare in particular is concerned with controlling behaviour and also having fun. The care provided by parents embodies all of these elements. It is not just something people explicitly do; it is an underlying responsibility and constraint that pervades the entire day (Budig and Folbre 2004).

Care is a physical activity but can also be solely a mental activity i.e. something that requires thought alone. The physical aspect of care is often referred to as ‘active care’

³ Information about the location of respondents, which is also contextual, is also provided although this is not utilised in chapter.

⁴ Some diaries were dropped as they had excessive amounts of missing time, and there was a small number dropped as they had completed children’s diaries and therefore had no co-presence information pertaining to children in the household. A diary is deemed unusable if there is more than two hours of missing time.

whereas the mental activity is often referred to as ‘passive care’. This distinction is somewhat misleading, as a mental activity is nonetheless an activity if activity is defined generally as something one does. Measures of childcare from the child’s perspective have developed the concepts of engaged and accessible time.⁵ Being engaged with a child refers to time when a parent and child are actively engaged in some shared activity. Being accessible to a child refers to time when parents and children are not engaged in some activity together but are at the same location.

In some measure these are analogous to the active/passive distinction where passive care is most likely to be time when the parent is accessible to the child and active care alike to engaged time. This engaged/accessible dichotomy is arguably much clearer but difficult to elicit from parent diaries alone. If parents record childcare as a specific primary activity then they can be regarded as being actively engaged. If they record childcare as a secondary activity, the level of engagement is not obvious. Furthermore if they record only co-presence then we can only state with confidence that they are at least accessible to the child; however, they may be engaged with a child, in that both the child and parent may be doing the same activity together. In the absence of direct observations of children, it is not possible to discern accurately whether children are engaged with their parents.

2.3 Methods

In many respects the methodological debate on quantifying childcare has revolved around the best way to capture passive care. Active care is reasonably well recorded by primary activity diaries alone (Gauthier et al 2005). Time budget surveys offer the best source of data for estimating how much time individuals spend doing a range of primary activities including childcare (Gershuny 2000). The debate in the literature could be summed up by asking: does the inclusion of secondary activities in the diary instrument obtain a good measure of passive childcare or are there other, better ways of doing it? The remainder of this section discusses the strengths and weaknesses of secondary activity diaries and then discusses some recent methodological developments in measuring passive care in time use surveys. Finally, the methodology used in this paper is introduced.

⁵Yeung et al (2001); Folbre et al (2005). See also Mullan (2006)

Secondary Activity Diaries

Diary instruments often contain space for respondents to record a secondary activity. These are included in time use surveys in an attempt to capture situations where people multi-task and it is argued that childcare, especially the more supervisory or passive element of care will often be done as a secondary activity (Pollack 1999). It has also been argued that secondary activities capture more of the element of constraint in time use that parents experience, and that they allow researchers to identify activities carried out when doing childcare. An experience like shopping for example will be qualitatively different if carried out with children (Craig 2002, 2006). So secondary activities may capture passive care but can also show how the presence of children may intensify or add to a primary activity experience.

Adding secondary activity childcare to primary activity childcare, without exception, results in an increase in the total time parents spend doing childcare. Not collecting this information will therefore result in an underestimate of total childcare time. However the amount of time added varies. Fedick, Pacholok and Gauthier (2005) report that measures of secondary childcare time vary widely from 30% of total childcare time to four times as much secondary activity care as there is primary activity childcare.⁶ They conclude that secondary activity care is likely to be more sensitive to the way in which instruments are worded. Folbre & Yoon (2005) echo this and also argue that the way in which childcare activities are coded is likely to impact on measures of secondary childcare time. In particular, the more detailed the coding structure the more secondary activities tend to be recorded. This variation therefore may be the result of the particular coding of instruments or the instructions given to respondents.

A second potential source of variation may be attributed to respondents themselves. Some have commented on the concern that the recording of secondary activities has nothing to do with the real amount of these activities a person actually does, but rather a respondent's willingness or ability to record them (Budig & Folbre 2004: P. 59 citing Bittman). Furthermore, the words primary and secondary suggest an ordering

⁶ See Budig and Folbre (2004: P. 58-59) for details of variation within American surveys.

where individuals who are performing more than one activity may rank those activities. They may rank them in order of physical effort, but with respect to childcare, mental effort or the degree of attention is as important. As such these orderings are very subjective (Budig & Folbre 2004: P. 59). One individual may record childcare as a primary activity and watching TV as a secondary activity whilst another individual may also record both these activities but in the reverse order. It may therefore be misleading to attribute objective qualitative distinctions to activities based on whether they have been recorded as primary or secondary.

A further problem with the primary/secondary distinction arises from the fact that the same activity codes are used for both, and this is exacerbated when the coding scheme is not very detailed.⁷ For example, the two largest care activities in UKTUS are 'physical care and supervision', and 'reading, playing or talking to a child'. Each of these childcare activities can be recorded as a primary activity, a secondary activity, or even as some combination recorded simultaneously as primary and secondary. These two activities combined, constitute nearly all of secondary childcare recorded in the data set.

When parents record 'reading, playing or talking to a child', regardless of whether this is a primary or secondary activity, it can always be interpreted as active and a child must surely be in close proximity to the parent interacting on some level. On the other hand, if recorded as a secondary activity, is 'physical care and supervision' more likely to be supervision than if recorded as a primary activity? Differentiating between a specific childcare activity and supervisory or passive childcare is fundamentally important, but relying singularly on the primary/secondary activity distinction is not necessarily the most suitable approach when the activity codes for both primary and secondary are the same, and especially when there is no specific code for passive care.

Summing recorded primary and secondary activity care is therefore not equivalent to adding total active and total passive care. Total active care is likely to be reasonably

well estimated by the sum of recorded primary and secondary care, but recorded secondary activity care is likely to contain an active element and some recorded primary activity childcare may be passive. The American Time Use Survey 2003 (hereafter ATUS) and the Australian Time Use Survey 1997 (hereafter TUS) both contain specific codes for passive care that can be (and are) recorded as a primary activity (Folbre & Yoon 2005). In UKTUS there is no specific code for passive care, but it is impossible to ignore the possibility that some of the physical care and supervision recorded as a primary activity is indeed supervision. Finally, secondary activity childcare will not capture all the passive care. The recording will vary with a respondent's awareness of their mental activity as well as their physical activity.

Beyond activity

Secondary activity time recorded in the diary format is more likely to capture the more passive element of care, but it is still a mechanism for respondents to record an activity, which many respondents are likely to think of in physical terms. ATUS does not ask respondents to record secondary activities, but asks if a child was 'in your care' whilst they were doing particular activities throughout the day. This is a direct attempt to capture the more passive element of care. This care is described as a 'state of being mindful of, and responsible for, a child while engaged in some other, primary activity' and is referred to as 'secondary childcare' (Schwartz 2002: P35). One should note the omission of the word activity from the previous quotation. This move away from an activity centred notion of care is an important development. As opposed to asking respondents each time a primary activity was recorded it was decided to ask the question upon completion of the diary how much time a child was 'in their care' throughout the day.

A measure, similar in object, was used in the 1998 Canadian General Social Survey. Here respondents were asked about the time they were 'looking after' children throughout the day. Pre-testing of the phasing of the term 'in your care' was conducted comparing it to the phrase 'looking after' as used in the Canadian survey (Schwartz 2001). This study found that the phrase 'looking after' was too closely

⁷ The coding of the activity diary reflects a level of generality. An activity is coded at the most general level first e.g. childcare, and then individual tasks within this general code are specified e.g. reading,

associated with actually being able to see the child. The wording of the question used to obtain the 'in your care' estimates specifies physical proximity in that respondents has to be 'near enough to provide immediate assistance' (Schwartz 2001: P. 36). This leaves scope for time when children are not within eyeshot, but are within earshot.

Fedick, Pacholok and Gauthier (2005) argue that the time spent 'looking after' children is comparable in magnitude to being co-present with children recorded in the same survey which in turn is comparable to some measures of secondary activity childcare. However, they state that the latter two are not necessarily measuring the same thing. Co-presence in the Canadian survey is loosely construed in that people did not necessarily have to be in the same room. This contradicts to some extent the contention that the phrase 'looking after' is biased to being in the same room but it may just be the case that co-presence was interpreted by respondents in very close proximal terms. It is impossible to be conclusive here, reflecting the difficulties associated with cross national comparisons, once expanded definitions of childcare are introduced. Folbre and Yoon (2006: P. 12) compare the time American parents record a child being 'in their care' with the time that Canadian parents record 'looking after' a child and find significant differences as a result of the difference in wording. They conclude that 'international comparisons of the larger temporal demands of child care (beyond primary activities of care) are even less comparable than measures of aggregated primary child care activities.'⁸

Co-presence

A variable like 'in your care' or 'looking after' is not available in UKTUS but it does contain secondary activity diaries. Given the weaknesses outlined above both in conceptual and methodological terms it seems unwise to rely on this measure alone. It has been stated that using co-presence would be a reasonable alternative to the 'in your care' approach.⁹ This is the method adopted in this study. Co-presence is the part

playing or talking to a child.

⁸ Some of this difference may also be due to another aspect of the wording in the two surveys. The Canadian survey asks 'what other times' whereas the American survey asks 'at which times'. The difference is important if Canadian respondents only include the time not already acknowledged in the primary activity diaries. The interviewer in the Canadian survey points out that the reason for this question is that the primary activity diary 'just completed' may not capture all the time doing childcare. It is not certain that this is the case but certainly not unreasonable.

⁹ Folbre and Yoon (2005) footnote 1.

of the diary instrument where respondents record who they were with during the day. Co-presence is not specifically tied to any particular activity but recorded throughout the day for all activities and the categories for 'with children' are included with other categories therefore no undue attention is drawn to them.¹⁰

Craig (2005) uses the co-presence data in the Australian Time Use Survey 1997 to calculate the time parents spend in recreation without a child being present to compare differences in the amount of 'child-free leisure' between sole and couple parents. She also looks at the time that parents spend alone with children, which it is argued is a good measure of the degree to which carer has responsibility for the care, as opposed to assisting in the care of children. She finds that sole mothers spend more time in the company of children and finds that they also have more time in childfree leisure. Craig (2006) looks at differences in the time mothers and fathers spend in sole charge of children and finds that mothers spend a higher proportion of their time with children in sole charge compared to fathers. Both these measures show how an increased understanding of childcare can be found by introducing co-presence information into the analysis.

The main problem with using co-presence in UKTUS is that it is not clear how close in a spatial sense the parent is to the child when they say they are 'with' the child. This problem has been highlighted by others in relation to time use surveys in general. Blanke (1993)¹¹ found that 21% of people interpreted co-presence loosely as being in the same building; a further 50% interpreted it more closely as being in the same room and a remaining 29% did not have any particular opinion on which it was. These results have been used to argue that co-presence can be somewhat ambiguous (Harvey and Royal 2000: P.14). If parents interpret co-presence very closely, i.e. the child is with them in the same room, then co-presence will understate the total time that children could be said to be in the care of their parents. Children may be at the same location, but in another room, or outside in the garden. Some parents are likely to interpret co-presence to include these types of scenarios but it is not possible to say exactly the extent to which this is the case.

¹⁰ Reading from left to right the child categories are first so there may be an ordering effect but it is not possible to test for this.

Above, it was noted that the phrase ‘in your care’ was chosen so as to not be restricted to situations where parents and children are in the same room. Folbre and Yoon (2005) find that parents were co-present, i.e. in the same room as a child, for 68% of this time the they recorded a child being ‘in their care’. If ATUS had not restricted co-presence to being in the same room, it would be impossible to rule out the possibility that co-presence was capturing some time when parents and children were at the same location, but not in the same room. What we can say is that co-presence, as defined in UKTUS, is going to capture all the time that parents and children are in the same room, or close confined space. We cannot say how much of this time is when they are not in the same room but at the same location. Also, the amount of time they are at the same location which is not captured by co-presence is unknown.

This does not detract from using co-presence as a basis for measuring childcare. It does, however, place bounds on the scope of the measure. In particular it is likely to be an underestimate of the total time parents can be said to be caring for their children in its broadest sense. It seems fair to conclude that the ‘in your care’ measure in ATUS is probably the most accurate total measure of childcare currently available for that country and methodologically speaking, represents a significant improvement on other measures worldwide. Its main advantage lies in the fact that it incorporates the time that parents and children are in the same room, and also the time that parents are in the same location as their children, and perhaps even further. Finally, and perhaps most importantly, it abstracts from specific activities.

The figure of 68% quoted above, of total time ‘in your care’ when children were co-present (in the same room) suggests that the remaining 32% of the time when children are ‘in your care’, or a large proportion of it, is when children are at the same location. It will not be possible to ascertain this degree of detail using co-presence alone as it is loosely specified in UKTUS to include times when children are in the same room, and times when they are at the same location. More generally the ‘in your care’ measure can be used as a basis from which to compare and contrast differing

¹¹ Cited in Harvey and Royal 2000: P. 13-14

type of care¹², a pervasive feature within which to nest activity. In essence it is a quantitative measure of the underlying, overarching, care context. The argument here is that co-presence provides a similar, if limited, alternative to this.

Because this is a study of a parent's time input, it is not possible to ascertain how many children a parent is with at any moment in time. If there are two children in the household it is not possible to say, with certainty, whether the parent is with the two children, or only one of them. This is an acknowledged drawback of parent-centric childcare studies (Folbre et. al. 2005). For this reason it is only possible to say that a parent is with at least one child, even though they may in fact be with more than one. The measure therefore is restricted to time with at least one child. This is still a valid, if somewhat crude, measure. Nonetheless Budig & Folbre (2004) argue that parent centred diaries represent the best way of measuring the total time input into the care of their children.

3. Three States of Being with a Child

In what follows, three states (as opposed to types) of care are outlined, all of which have a common factor, which is that parents have explicitly recorded being with at least one child. The first state is called undivided care and refers to time when parents record a primary care activity and either nothing else or an additional childcare activity. The second state is called combined care and refers to time when parents record a specific childcare activity (primary or secondary) combined with another (non-childcare) activity and finally, there is non-specific care, which is the time that parents record being with a child but do not record any specific childcare activity. There is a diverse range of interaction contained within any one state.

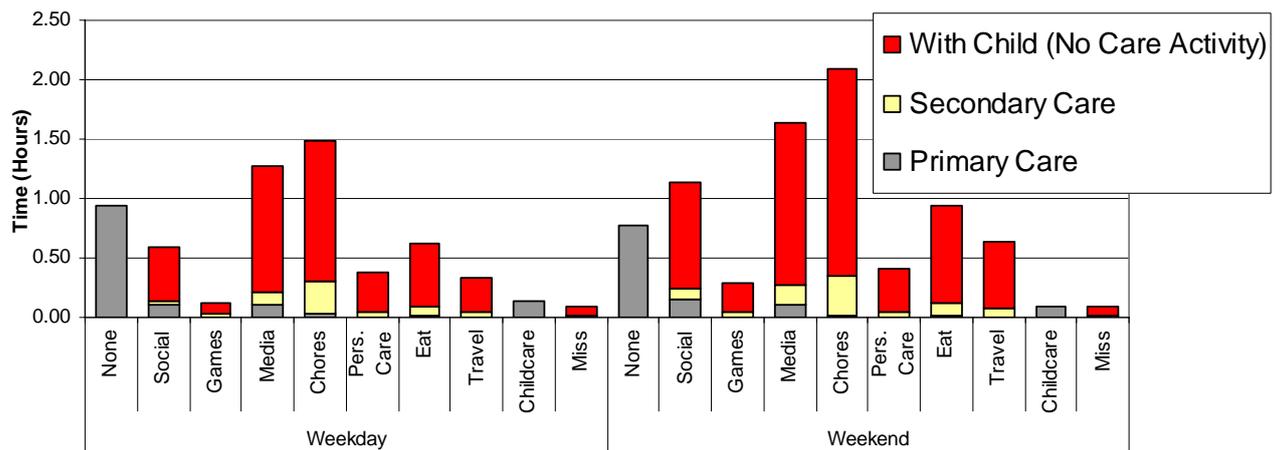
At the outset one could argue that undivided care is the most intensive, combined care less so and non-specific care the least intensive. In saying this, what is being asserted is that the intensity of childcare is related to what parents are actually doing when they record being with a child. In order to investigate this, a parent's day is divided into twelve distinct components, ten of which correspond to activities. These

¹² See Folbre and Yoon 2005 for detailed comparisons.

activities are: socialising, games, media, housework, employment/study, personal care, eating, childcare and sleep. The remaining two categories are ‘missing/na’ and ‘none’. The category ‘missing’ is computed from codes which arise in both the primary and secondary activity diaries and is simply a residual of time not clearly in any of the prior ten categories.¹³ The category ‘none’ is computed from a code that only arises in the case where a secondary activity is not recorded.

The average time recorded by parents doing a range of activities, whilst they record being co-present with a child, is shown in Figure 1 for weekdays and weekend days. The shading of the bars in Figure 1 represents time when care was recorded as a primary activity, care recorded as a secondary activity and finally being with a child but not recording a specific childcare activity. In all cases the activity listed on the X-axis is the primary activity except for the portion shaded ‘primary care’, whereupon the activity on the X-axis is secondary. For example on a weekday, for about 20% of the average time spent doing chores as a primary activity in the presence of at least one child, parents also record doing childcare as a secondary activity. On a weekend, for about 12% of the average time parents spend socialising, socialising is recorded as a secondary activity with the primary activity being childcare.

Figure 1: Total time with children, doing a range of activities including childcare as both a primary and/or secondary activity.



State 1: Undivided care

¹³ It includes illegible information in the diaries, filling in the diary and punctuating activity.

The majority of time spent doing primary care is not combined with any other activity. To this can be added the time that childcare is also recorded as a secondary activity when recorded as a primary activity. In other words, when childcare is recorded as a primary activity, for most of this time the care activity is not combined with another activity or it is combined with other childcare activities. The clear prominence of this time demonstrates that it is distinct from other times when care is combined with other activities, or when a parent is not doing any specific care activities. To repeat, this state will be referred to as undivided care although it does include situations where primary activity childcare is combined with secondary activity childcare.

State 2: Combined care

Secondary activity care is often referred to as simultaneous by definition. However, primary activity care when combined with another activity is also simultaneous care. The difference is that secondary care *will always* be simultaneous whereas most recorded primary care, as demonstrated above, is not. The common variable by which these two can be compared is the other activity being done. The natural comparison to this is care being done with no other activity. The other activities that specific childcare activities are combined with can be grouped into three categories: leisure activities, domestic work activities and what can be termed necessary activities (eating and personal care). It is also combined with travel. Travel is different as it must be coded as the primary activity in UKTUS.

When recording care combined with a leisure activity respondents are divided relatively evenly as to whether the care is recorded as primary or secondary. On a weekday the ratio for primary is .60 and on a weekend it is .51. When combined with care activities, other domestic work is mostly recorded as the primary activity (.86 and .89 for a weekday and weekend respectively). Finally, necessary activities are recorded more as the primary activity when combined with childcare (.82 and .84 for a weekday and weekend respectively). That these latter two groups are mostly recorded as primary seems to suggest that the childcare recorded with them is less demanding, which would accord with the perspective that childcare recorded as a

secondary activity is more passive, at least compared to primary activity care recorded singularly.

It is not clear that the same can be said of primary activity care combined with secondary activities. Is this time as intensive as the primary activity care with no secondary activity, or is it more like secondary activity care? Williams and Donath (1994: P: 439) conclude that if two activities are being carried out at the same time then 'input hours into each should be weighted equally at one half'. They offer the example that it does not seem worthwhile to differentiate between watching TV and looking after children, or looking after children and watching TV. With this example they are arguably correct, and as shown here parents are as likely to record it one way as they are the other. That the primary activity care is recorded with a leisure type activity as secondary, suggests that it is relatively passive, or at least not so much of a chore. Like secondary activity care, it seems reasonable to make a clear distinction between this and primary activity care recorded as the sole activity.

Pollack (1999: P. 8) suggests developing what are termed 'compound activities'. In effect this means treating simultaneous activities as a single activity. It is acknowledged that this may create an intractable number of activities such that restricting them to those situations where care for children or adults is part of the compound activity might be preferable. Three such 'compound' activities have been identified here: care time with leisure, with other housework and with personal care (including eating). Detailed analysis of these activities would be an interesting subject of further work. For this study these are aggregated into a general 'compound' activity, which is called combined care.

State 3: Non-specific care

Quantitatively the most significant amount of time with children is when parents are not recording a specific childcare activity: non-specific care. It is clear that omitting this time will lead to an underestimate of the total time a parent could be said to be caring for a child. Bearing in mind the discussion above, it is not clear exactly how close parents and children are in a proximal sense, but it is clear that parents are mindful of their children's presence. This time is dominated by domestic work,

television viewing and other passive media consumption. The weekend sees increasing amounts of socialising, eating, travelling and games when with a child.

Gender differences

Differences by gender are important and are discussed comprehensively throughout this paper. The picture shown in figure 4 does not alter dramatically in a proportional sense, when produced for men and women separately. In other words the three states of co-presence are as apparent for fathers as for mothers. The key differences in the total time with children are discussed here. In absolute terms fathers spend four hours on a weekday and seven hours on a weekend with at least one child. For mothers the averages are seven hours on a weekday and nine hours on a weekend. There is no significant difference on a weekday in the time fathers and mothers spend playing games or watching TV when with at least one child. On a weekend, fathers spend more time recording games and exercise when with children compared to mothers ($P < .01$). Fathers also spend more time watching TV and other passive media when with children on a weekend ($P < .01$). There is also no significant difference between mothers and fathers in time spent eating or travelling when with at least one child. Other than this, mothers spend more time with children across a range of activities. The difference in the time that mothers spend doing domestic work compared to men is particularly stark. On a weekday women spend about three times as much time as men do, and about twice as much on a weekend. In conclusion then, the above picture differs in a proportional sense between men and women in one clear respect across both day types. Fathers spend more time watching TV with children than doing chores, with the reverse being the case for mothers.

Relationship between the three states

In order to begin to explore the relationship between the three states, a dummy variable is created indicating whether a parent records a positive amount of combined care. The mean time spent in undivided care and non-specific care, are reported in Table 1 for those parents who do and do not record combined care. It can be seen that those parents who record a positive amount of combined care, record on average about 2 hours more time doing non-specific care. On a weekday for example, parents who do not record combined care record on average 2.8 hours of non-specific care

compared to 4.9 hours for those parents who do record combined care. Furthermore, these parents spend about three times as much time doing undivided care. On a weekday once again, those parents who do not record any combined care record on average .4 hours of time doing undivided care, compared to 1.1 hours for those parents who do record combined care.

Table 1: Mean time in undivided care and non-specific care, by combined care

		Combined Care	No Combined Care
Weekday	Non-Specific Care	4.9	2.8
	Undivided Care	1.3	0.5
Weekend	Non-Specific Care	7.1	4.7
	Undivided Care	1.1	0.4

These figures suggest that combined care is not a substitute for other measures. Parents who record combined care are recording more undivided care and more time being with a child whilst not doing a care activity. The relationship between the three appears to be complementary.

4 Non-Parametric and Descriptive Analyses of the Three States

Looking closely at the activity profile of parents whilst they are co-present with a child aged 0-14 years has led to the definition of three states of being with a child: undivided care, combined care and time with children but not doing a specific care activity. These states are analysed here with respect to some well established factors that have been found to determine the time spent caring for children, beginning with the age of the youngest child and continuing with the number of children.

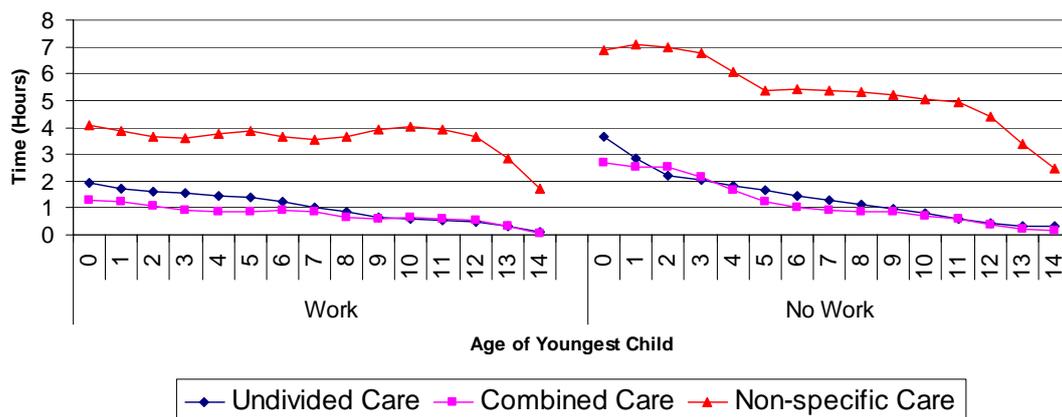
The age of the youngest child

The three states are plotted with respect to the age of the youngest child using a locally weighted non-parametric smoothing technique, which produces smoothed means.¹⁴ This procedure involves performing a weighted regression on every observation of time spent in each state on age of the youngest child, using a certain proportion of the data. The procedure gives the maximum weight to the central point (i.e. the particular observation) and decreasing weight as the distance from this point

increases.¹⁵ The bandwidth used is .3 meaning that 30% of the data around each data point is used in the regressions. The procedure is advantageous because it follows the data very closely. A predicted value for each point in the data set is generated based on the results of these regressions resulting in a smoothed plot of time spent in each state by age of youngest child that are shown below.

The analysis breaks the sample down by gender of the parent, day type and whether the parent worked on the diary day or not. On a weekday clear differences can be observed overall between women who work and those who do not. These differences are more pronounced when the age of the youngest child is less than five. The quantitative significance of non-specific care is reflected here clearly regardless of work status.

Figure 2: Age of the youngest child and the three states: women on a weekday



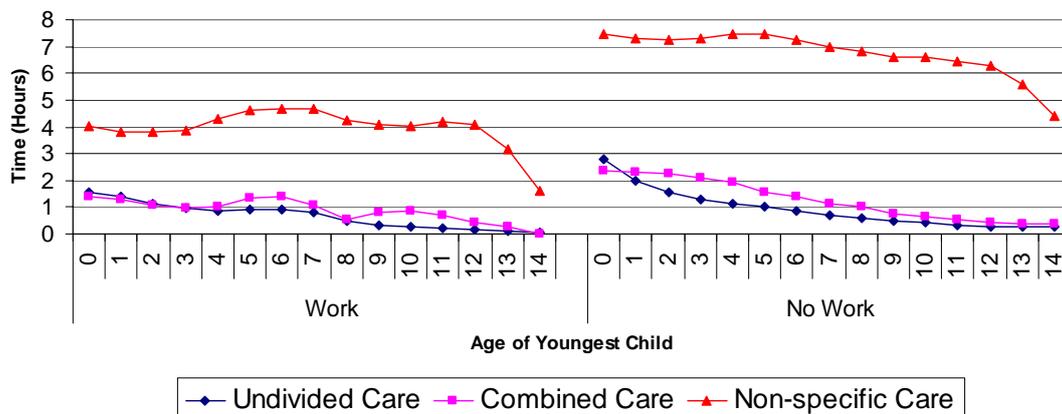
For women who do not work on a weekday, the impact of school as the age of the youngest child increases is clearly visible in the time that they spend doing non-specific care. There is a clear decreasing relationship between undivided care as the age of the youngest child increases. Time spent doing combined care is very similar to time doing undivided care when the age of the youngest child is greater than nine years, regardless of whether the mother is working or not. At younger ages, undivided care is greater. Non-specific care remains relatively constant with respect to the age of youngest child for women who work, dropping significantly only when the youngest

¹⁴ This procedure is carried out using the Lowess command in Stata 9.

child is older than twelve years. The sample size of women who do not work also declines significantly as the age of the youngest child increases over twelve years. Women who do not work spend more time with children overall, but much more when the child is very young.

On a weekend (Figure 3), as expected the impact of school disappears for women who do not work. The time spent doing combined care is greater than the time spent doing undivided care. This is more pronounced for women who do not work compared to those who do. Clearly, there is more non-specific care on a weekend day as it is not a school day. This increase in demand for care is met with a supply of non-specific care and increased amounts of combined care. The relative slopes of the lines suggest that as children age, women spend less time with them, but more of this time is of a less intense nature. Folbre & Yoon (2006: P17) report a similar finding.

Figure 3: Age of the youngest child and the three states: women on a weekend



Overall men spend less time in all three states (Figures 4 & 5). This remains the case even when women and men who both work are compared. It should be noted that more women work part time. The gap narrows somewhat on a weekend day and especially so for non-specific care. However, comparing men and women who do not record working on the diary day, women are still with at least one child for more time than men.

¹⁵ See Cleveland (1979) for a more detailed formal exposition.

The general picture for men is similar to that for women, the main difference being quantitative i.e. the quantities of time differ but the relative slopes of the lines are very similar. For those fathers who work, on either a weekday and/or a weekend day, there is very little difference in the amount of undivided and combined care, across the age spectrum of the youngest child. For those men who do not work, on a weekday they record more undivided care when the age of the youngest child is less than four and more combined care when the youngest child is eight years or more. On a weekend, there appears to be more combined care. Non-specific care is very similar to women with respect to the age of the youngest child but mothers remain the chief caregiver.

Figure 4: Age of the youngest child and the three states: men on a weekday

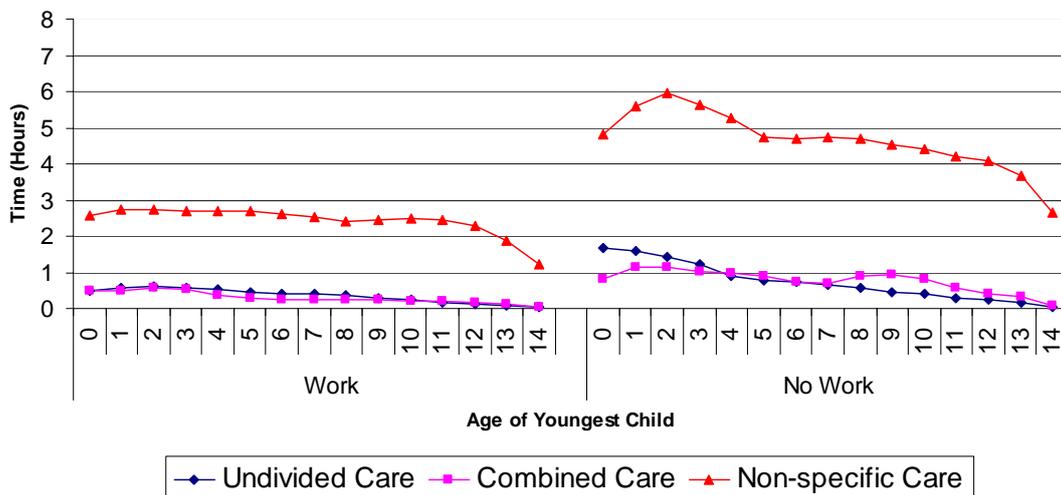
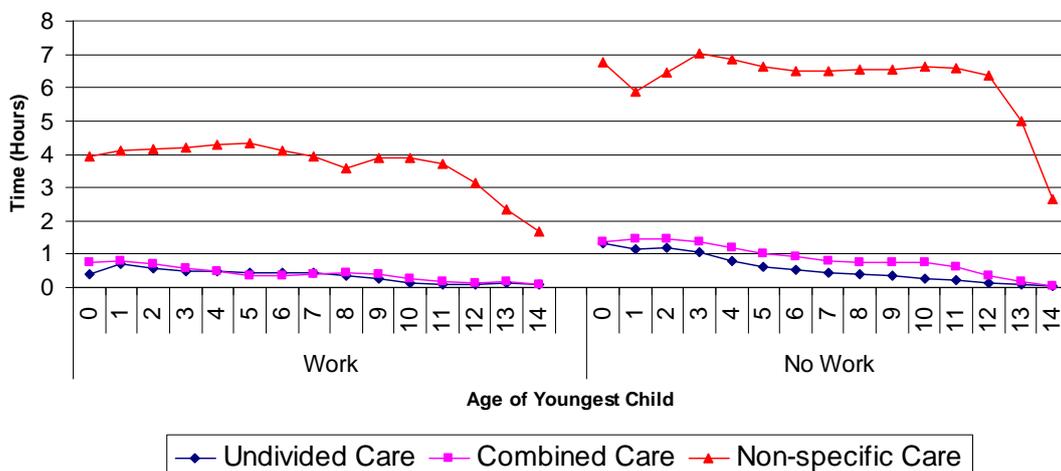


Figure 5: Age of the youngest child and the three states: men on a weekend



The number of children

Social scientists often look at the margin, at the effect of adding or subtracting one extra unit. In the context of childcare, the marginal unit is the youngest child. Bittman and Craig (2005) look at how the effect of increasing numbers of children is itself affected by the age of the youngest child. They find that when the number of children increases from one to two, the time spent in childcare activities increases. However as the age of the youngest child increases, the economies of scale decline. They argue that proportionately, the time cost of additional children is higher the older the children. Furthermore, when the number of children increases from two to three or more, the total time actually decreases when the age of the youngest child is pre-school. They speculate, amongst other things, that this could be attributable to the presence of an older sibling helping look after a younger sibling. Their data does not however have a measure of the age gaps between children.

In order to assess the impact of the youngest child, on families with two or more children, parents have been divided into three groups based on the age profile of the children in the household. The first group contains parents whose children are aged between zero and four years. The second group contains parents whose children span a larger age range (5 – 14 years) and the final group contains families with children in both age groups. Within each of these groups differences in the time spent in childcare by parents who have one child, two children or greater than two children are examined.

By construction, the latter group has to contain at least two children and therefore analysis is restricted to differences between parents who have two children and those who have three or more children. This comparison will specifically look at the addition of a younger child (< 5 years) into a household with older children (> 4 years). The first group, with the youngest children, consists mostly of single and dual child households, with a small number of three or more children. This limits a reasonable comparison to differences between one and two children. Sample sizes in the school age group permits comparison from one to two children, and from two to

greater than two children. Table 2 reports the mean time spent with children, for mothers and fathers on a weekday and weekend day respectively.

Table 2: Mean Time in Each Care State by Number of Children and Age Profile of Children

Care: Mothers		<u>Weekday</u>			<u>Weekend</u>		
	Number of Children	Pre-School	School Age	Mixed	Pre-School	School Age	Mixed
Undivided Care	One Child	1.9***	0.5***	-	1.7	0.3**	-
	Two Children	2.5	0.9	1.7***	1.7	0.6	1.2
	GT Two Children	2.3	1.1	2.3	1.7	0.6	1.4
Combined Care	One Child	2.2**	0.6***	-	2.3	0.5**	-
	Two Children	2.9	0.9	1.9	2.2	1.1	2.1
	GT Two Children	5.9	1.0	2.2	5.3	1.0	2.4
Non-specific Care	One Child	5.2**	3.4***	-	6.8	5.4	-
	Two Children	6.2	4.4	5.7	7.1	6.5	6.9
	GT Two Children	5.5	4.7	6.3	7.1	6.8	6.9
Total Time with Children	One Child	9.3***	4.5***	-	10.9	6.3**	-
	Two Children	11.7	6.3	9.3**	11.0	8.3	10.3
	GT Two Children	13.7	6.8	10.8	14.1	8.4	10.6
Care: Fathers		<u>Weekday</u>			<u>Weekend</u>		
	Number of Children	Pre-School	School Age	Mixed	Pre-School	School Age	Mixed
Undivided Care	One Child	0.6*	0.2*	-	0.8*	0.2	-
	Two Children	0.8	0.3	0.9*	1.3	0.3	0.8
	GT Two Children	1.0	0.4	0.6	0.7	0.5	0.7
Combined Care	One Child	0.7	0.3*	-	1.4	0.3	-
	Two Children	0.6	0.5	1.0**	1.4	0.8	1.4
	GT Two Children	0.7	0.3	0.5	2.9	0.7	1.1
Non-specific Care	One Child	2.9	2.8	-	5.7	5.0	-
	Two Children	3.2	3.1	3.9	6.2	6.0	6.0
	GT Two Children	3.4	3.2	3.6	5.3	5.5	6.1
Total Time with Children	One Child	4.2	3.2*	-	7.9	5.6	-
	Two Children	4.7	3.9	5.8*	9.0	7.0	8.3
	GT Two Children	5.1	3.9	4.6	8.9	6.7	7.9

NB: *** P < .001, ** P < .01, * P < .05

Looking at parents whose children are all pre-school age, on a weekday there are significant differences in all three states between those who have one child and those who have two children. On a weekend there are no significant differences. For example on a weekday mothers who have two pre-school age children record 2.5 hours of undivided care compared to 1.9 hours recorded by mothers who have a single pre-school child. Fathers of two children who are all pre-school age on the other hand, record doing more undivided care on a weekday and a weekend. On a weekend they record 1.3 hours of undivided care compared to their counterparts with a single child of preschool age, who record 0.8 hours of undivided care. In the remaining two states there are no significant differences.

Results show that the time in different states is most sensitive to the number of children when all those children are of school age. However the significant differences are restricted to families with one child of this age, and those with two children of this age. There are never significant differences between this latter group and those families with three or more children. For mothers and fathers on a weekday there are significant differences across all three states. The only exception to this applies to the time fathers are doing non-specific care. There are no significant differences on a weekend for fathers across all three states. For mothers there are differences except for non-specific care. For example mother with two school age children spend 1.1 hours doing combined care, compared to a half hour that mothers with a single child of this age spend. They also spend twice as much time doing undivided care on a weekend (.6 hours compared to .3 hours).

Finally there is the mixed group containing at least one child from each age group. Comparisons are restricted here to differences between parents who have two children and those who have three or more children. On a weekend there are no significant differences in the time spent in any of the three states for mothers or fathers. It is not immediately clear why this is the case, although speculating, it might be due to the older children helping out with caring for the younger child on a weekend. On a weekday, a significant difference is observed in the time a mother records doing undivided care. Those who have more than two children record an average of 2.3 hours compared to 1.7 hours for those mothers who have two children. Fathers who

have three or more children spend less time overall with at least one child compared to fathers who have two children, where at least one of those children is less than five years and the rest are of school age. Results show that this decline is significant for undivided and combined care but not so for non-specific care. The time spent doing combined care halves to thirty minutes from one hour.

These results reinforce those of Bittman and Craig (2005), which showed that even though in absolute terms the time spent with children declined, the older the children in the household, the more effect increasing numbers of children had proportionally on the time parents spent with them. The proportional increases have been greater in the school age families compared to the pre-school families. The decline that they observe, when the age of the youngest child is less than five, and the number of children increases to three or more is only observed here for men's undivided and combined care and only on a weekday. For women, having more than two children, and when at least one of those children is less than five, never results in a decline. Their finding that men who have two children spend the most time with children, is corroborated here to some extent, especially when those children are both school age.

5. Childcare Activities

The intention here is to elaborate on the first two states by introducing specific childcare activities. Childcare activities are grouped into three. The first type of care is 'physical care and supervision' (hereafter PCS). The second type of care can be referred to as developmental or interactive care and consists of reading, playing or talking to a child, and teaching a child (hereafter DEV). Finally there is accompanying a child (hereafter Accomp).¹⁶ These care types are segregated depending on whether the activity is undivided (UDV) or combined with another activity (COMB). Accompanying a child is by far conducted as undivided care, so I aggregate this with the small amount of time when it is combined with other activities. Finally a category 'other' is subsumed within PCS.

¹⁶ This typology is similar in spirit to that used by Bittman and Craig (2005) and Bittman, Craig and Folbre (2004) although the typology is less defined in this study as the coding of childcare is not as detailed in UKTUS as it is in the Australian Time Use Survey (TUS), or the American Time Use Survey (ATUS).

The average sum total of primary and secondary activity childcare is 118 minutes on a weekday, and 121 minutes on a weekend. The gender and education of the parent are well established important factors in determining childcare time. Table 4 reports the mean time in minutes that parents spent doing childcare activities looking in particular at gender and education. Unless otherwise stated the differences are significant at the one per cent level. The comparisons are between characteristics listed on the left hand side of the table and not between care types.

Table 4: Mean Time (Minutes) in Different Care Activities

	PCS		DEV		Accomp
	COMB	UDV	COMB	UDV	N/A
Weekday					
Mothers	46***	46***	24***	22***	27***
Fathers	15	15	11	11	8
Degree	37	34	20	21**	16
No Degree	32	32	18	16	19
Weekend					
Mothers	56***	40***	26	18	7
Fathers	29	16	23	17	5
Degree	50	34	34**	24**	7
No Degree	43	29	22	16	6
Total (WD)	32***	32	18***	17	18***
Total (WE)	44	30	24	18	6

PCS: Physical care and supervision; DEV: Interactive care; Accomp: Accompanying a child; UDV: Undivided care

COMB: Combined care

*** P<.001, ** P < .01, * P < .05

Looking first at differences in the total time in each category between a weekday and a weekend day, overall there is more combined care on a weekend day than on a weekday. The sum of the total in columns one and three is 68 minutes on a weekend compared to 51 minutes on a weekday. Most of the change in undivided care results from a reduction in the time spent accompanying children on a weekend. Parents on average spend triple the time accompanying children on a weekday compared to a weekend day. This can largely be attributed to the school run. Approximately the same amount of time is spent accompanying children on a weekday as is spent in undivided development care, on either a weekday or weekend day. This result is similar to findings from the Child-Development Supplement of the PSID 1997.¹⁷ Physical care and supervision constitutes most childcare activity time. Finally, parents

¹⁷ See Budig and Folbre (2004: P. 58).

spend more time reading, playing or talking to their children on weekends than on weekdays, especially when combined with other activities.

It has already been shown above in tables 1 and 2 that women are recording much more time with children than men. This pattern is revealed again when specific childcare activities are considered in detail. On a weekday the differences between men and women are significant across the range of childcare categories, regardless of whether the care is undivided or combined. The gap between the sexes narrows on the weekend. In particular, a father's engagement in developmental care increases on a weekend, such that there are no significant differences between mothers and fathers in this type of care on a weekend. Furthermore, fathers and mothers are spending the same amount of time accompanying a child on a weekend.

On a weekday there is a significant difference in the time parents who have a degree record doing combined developmental care compared to those who do not have a degree. On a weekend there are significant differences in the amount of undivided and combined developmental care with those who have a degree recording more of this care activity. Education level is an important dimension of human capital and can be taken as a proxy of a person's value in the market. If we were to value the care provided by parents on the basis of personal characteristics it may be quite misleading. But by the same token it is important to recognise that different types of care may be priced differently in the market. It should be noted however that these results for degree status are for women and men combined. Potential interactions between gender and other demographic characteristics are examined in more detail in the following multivariate analysis.

6. Multivariate Analysis

There has been some recent discussion at the frontier of time use research concerning the appropriate method of conducting multivariate analysis of time use data. The discussion arises from the fact that often in a given sample, there will be a considerable number of zero values in the dependent variable. The argument centres

on the use of Ordinary Least Squares Regression (OLS) or Tobit Regression (Tobit).¹⁸ To cut a long story short, Tobit has been regarded as preferable to OLS but recent contributions have argued that OLS can be at least as good if not altogether preferable. This work is at quite an early stage. Recognising that there are questions about appropriate methodology I have decided to report the Tobit results in the main body of the paper and the OLS results are reported in appendix 1. There is little substantive difference between the results but this should not be taken as meaning it doesn't matter which is used. This is not strictly a methodological paper and no conclusions should be drawn concerning which approach is best. This issue will be developed in future work.¹⁹

The models

Six Tobit models are specified to examine the determinants of different types and intensities of care time. The dependent variable for model (1) is undivided physical care and supervision (PCS (UDV)), model (2) undivided development and educational care (DEV (UDV)), model (3) accompanying a child (Accomp), model (4) combined physical care and supervision (PCS (COMB)), model (5) combined development and educational care (DEV (COMB)), and model (6) non-specific care. The dependent variable in all these models is the amount of time in minutes spent doing each different type of care.

The models are specified pooling observations for mothers and fathers. All explanatory variables are interacted with a gender dummy for male and female respectively, creating two sets of 'gendered' explanatory variables, all of which are included in the model. The main advantage of this is that the coefficients for men and women can be compared and differences formally tested within the model. The unit of analysis is the diary day. Recalling from above, there are a total of 4946 diary days but only 4763 diary days have information for all the explanatory variables.

¹⁸ See Stewart (2006) and Gershuny & Egerton (2006). There is another proposal that suggests modelling the distribution of the data as Poisson-Gamma (Brown & Dunn 2006). These three references all presented at the 2006 IATUR conference in Copenhagen.

¹⁹ Kristan (2006) takes the opposite approach to this by reporting OLS coefficients arguing that they are easier to interpret. She also finds that there is little substantive difference. I find that results for fathers are slightly more sensitive to the choice of method compared to mothers. This is unsurprising given that many more fathers record zero time in many of the models. For this reason I have chosen Tobit.

The majority of explanatory variables in the model can be grouped into those that pertain to children and those that pertain to the parents. Taking the children first there is the age of the youngest child, the number of children, the age profile of the children in the house, and a dummy variable to capture the effect of a small number of households where there are more than two children less than five years. For the parent there is age of the parent, whether the parent is a single parent, whether the parent holds a degree, whether the parent has a high level of managerial responsibilities in their occupation, and whether the parent records working on the dairy day. There is a dummy to indicate whether the diary day is a weekend day, and a variable for the number of adults (> 15 years) in the household other than the observed parent.

Results

Results are reported in Table 5 with the results of statistical tests on the coefficients between men and women reported in Table 6. The age of the youngest child is negative and significant across all care types and intensities, with the single exception of the time that a father spends accompanying children which is negative but not significant. The differences between the coefficients for mothers and fathers are significant and interestingly, it seems that whilst father's time decreases with age of the youngest child, it does not fall by as much as mother's time suggesting that fathers are spending proportionally more time with children as they age. The largest decline for both mothers and fathers is in undivided and combined physical care and supervision.

It is reasonable to expect that increasing numbers of adults or older young people in a household increases the potential pool of carers, thereby decreasing the potential time any individual parent spends caring. Results appear to confirm this but the decline in the time a mother spends doing undivided physical care and supervision, and a father spends accompanying children, are not statistically significant suggesting perhaps that these are activities that mothers and fathers 'specialise' in. For mothers, this type of care is interpreted as one of the most intense.

Table 5: Results from Tobit Analysis, Mothers and Fathers Pooled

<i>State</i>	<i>1</i>	<i>1</i>	<i>1/2</i>	<i>2</i>	<i>2</i>	<i>3</i>
	PCS(UDV)	DEV(UDV)	Accomp	PCS(Comb)	DEV(Comb)	Non-Specific
Mothers						
Age	0.8***	1.7***	0.8*	1.5*	0.6	2.4***
Age of Youngest Child	-11.5***	-7.8***	-3.1***	-17.7***	-5.8***	-9.9***
Number of Adults	-3.5	-13.9***	-19.6***	-13.6*	-14.0***	-50.8***
Number of Children	4.2*	-3.2	7.8**	14.7	-4.3	16.4*
No school age children	14.9***	8.4	-30.6***	14.2	1.2	-0.1
No school age children: GT 2 Child	35.0	-2.0	35.8	240.3*	4.0	-127.8
Lone Parent	1.3	-4.4	-14.0*	-10.6	2.2	-54.9***
Has a Degree	7.2	19.1***	3.6	28.9*	23.4***	17.2
Is Higher Manager	-0.5	-17.8*	8.6	0.6	-7.6	-17.9
Works on Diary Day	-23.0***	-14.4***	3.8	-38.3***	-11.9**	-154.7***
Weekend	-18.5***	-19.0***	-67.2***	-5.6	-4.9	46.6***
Fathers						
Age	-0.1	0.7**	-0.2	0.1	0.0	1.2
Age of Youngest Child	-9.2***	-7.1***	-1.2	-15.4***	-5.0***	-9.3***
Number of Adults	-15.5***	-10.2*	-12.9***	-8.9	-16.0***	-48.9***
Number of Children	-0.4	-1.6	1.6	-0.8	-5.0	6.5
No school age children	-2.7	-2.2	-47.7***	-29.6*	2.5	-45.4*
No school age children: GT 2 Child	37.0	-57.4	-382.2	228.7***	-67.5	-186.2
Lone Parent	9.1	-9.6	-15.4	117.2***	-7.9	-36.8
Has a Degree	-0.1	13.4*	4.8	1.6	8.0	-18.5
Is Higher Manager	3.1	-4.1	-4.5	37.7**	2.7	46.7***
Works on Diary Day	-37.2***	-24.3***	-22.7***	-73.5***	-34.8***	-174.4***
Weekend	-16.5***	2.0	-36.1***	-8.0	8.3	73.8***
_cons	66.2***	-6.5	-5.0	21.6	20.0	357.9***
N	4,763.0	4,763.0	4,763.0	4,763.0	4,763.0	4,763.0
Obs. Censored at zero	2,390.0	3,200.0	3,595.0	2,894.0	2,971.0	658.0
chi2	2301	726	722	1089	484	962
p	0.0	0.0	0.0	0.0	0.0	0.0
Pseudo R2	0.07	0.03	0.04	0.04	0.02	0.02

* p<0.05, ** p<0.01, *** p<0.001

Increasing numbers of children lead to increasing amount of time spent accompanying children and increasing amounts of combined physical care and supervision, although only for mothers. Interestingly, there is no evidence to suggest that parents increase the time they spend reading, playing, talking or teaching a child (DEV) either as undivided or combined, as the number of children increases. Although not statistically significant, for mothers and fathers the coefficients are negative. Within the context of the quality/quantity hypothesis²⁰ in the fertility literature, this is an interesting result in that it seems to suggest that the more children there are in the family the less time parents spend doing this type of developmental care, care which could be deemed to enhance the ‘quality’ of a child. However, it is also likely to be the case that aspects

²⁰ See Becker G., & Lewis H.G. (1973) and Willis R.J. (1973) for more details about this hypothesis.

of this type of care are non-rivalrous, i.e. one child's consumption may not necessarily obscure another child's consumption.

Table 6: Statistical Comparisons of the Coefficients for Mothers and Fathers

<i>State</i>	<i>1</i>	<i>1</i>	<i>1/2</i>	<i>2</i>	<i>2</i>	<i>3</i>
	PCS(UDV)	DEV(UDV)	Accomp	PCS(Comb)	DEV(Comb)	Non-Specific
	<i>F</i>	<i>F</i>	<i>F</i>	<i>F</i>	<i>F</i>	<i>F</i>
Age	5.34**	16.06***	3.63*	2.81	1.44	4.39*
Age of Youngest Child	187.45***	69.54***	10.12***	69.87***	20.78***	19.85***
Number of Adults	8.55***	11.5***	16.45***	3.39*	13.25***	32.34***
Number of Children	3.35*	1.07	5.61**	4.64**	2.45	3.77*
No school age children	9.27***	2.02	20.28***	5.35**	0.06	2.48
No school age children: GT 2 Child	2.53	0.85	1.89	19.05***	0.68	2.82
Lone Parent	0.27	0.79	3.05*	9.04*	0.25	7.9***
Has a Degree	1.6	10.24***	0.54	3.4*	8***	1.47
Is Higher Manager	0.27	2.56	0.67	4.32*	0.42	4.4*
Works on Diary Day	68.01***	23.94***	8.99***	37.47***	25.34***	193.25***
Weekend	30.12***	16.88***	156***	0.64	1.44	27.95***

* p<0.05, ** p<0.01, *** p<0.001

The age profile of the family is analysed using families where all the children are less than five years old as the reference category. The results show that the time that parents spend accompanying children is significantly less for households where none of the children are school age compared to households where at least one or all of the children are of school age. The value of the coefficient for fathers is almost twice that of mothers suggesting that fathers spend proportionally more time compared to mothers, accompanying children relative the rest of their time with children. Results reported in table two show this difference to be significant. This variable provides a good compliment to the age of youngest child variable. The coefficient on that variable is the lowest in the model for accompanying children compared to the other models and is not significant for fathers. This shows that this type of care is likely to increase as children age, or at least doesn't decrease by as much. Again, this is especially the case for fathers.

Looking at parent based factors the results show that single mothers record significantly less time accompanying children (model 3) and non-specific care (model 6). There are a small number of single fathers (27) in the sample. One striking result is the high amount of combined physical care and supervision (model 4), which single fathers do compared to those who are co-resident with the mother of their child.

Given the small sample of lone fathers one can not read too much into this finding. Single mothers are clearly not spending significantly different amount of time doing more intense care compared to their married/cohabiting counterparts. This is a similar finding to that of Craig (2006) who finds that lone mothers are compensating for the extra time that a father would spend looking after children. The big difference as stated above is in the model for the least intensive care type (Model 6).

Mothers who have a degree are spending significantly more time doing undivided and combined development type care and are also doing more combined physical care and supervision than mothers without a degree. Fathers who have a degree spend more time doing undivided development type care compared to fathers who do not have a degree, although the value of the coefficient is significantly less than that for mothers with respect to this model (model 2). Previous studies have shown that mothers with a degree, or higher levels of education, are spending more time doing care and more time in particular doing this type of care (Gauthier et al 2005, Sousa-Poza (ND), Sayer et al (2004)).

A degree is a proxy for a high level of human capital. Human capital is also acquired through work experience. One might posit that men are more like to acquire human capital from work experience compared to women. If this is the case then this may be a better indicator of human capital for fathers. A peculiar result is that women who are higher managers in employment are spending less time doing undivided development care (model 2). For fathers who are higher managers, there is an increase in the amount of combined physical care and supervision (model 5) and an increase in non-specific care (model 6), compared to those men with lower or no managerial responsibility. These represent the less intense types of care. Unlike degree status it is more difficult to draw reasonable conclusions about the 'quality' of the difference in care time, but it is clear that men who are higher managers are spending more time with a child than men who are not, and this is not the case for women. The difference in this coefficient between men and women is significant.

Working on the diary day has a negative impact on the amount of time recorded with children across all care types with the exception of accompanying which is positive

but insignificant for women. Overall the effect is stronger for men. A weekend day appears to result in less time spent in undivided care activities and more time in less intensive time with children. In the case undivided care (models 1 & 2) the reduction is stronger for women. This coefficient for men in model 2 is not significant. The increase in non-specific care (model 6) is higher for men. Again these differences are significant (see table 2). Folbre and Yoon (2006: P 18) report a similar finding. Finally the increasing numbers of other adults in the household has a negative effect on the time that parents spend with children.

7. Conclusion

This paper has set out to quantify the provision of childcare by parents in the United Kingdom. It was argued that to do this satisfactorily requires recognising that childcare involves a spectrum of attention from direct childcare activities to indirect supervision. Using co-presence as the basis of the measure, and looking at what parents are doing when with children, a clear range of intensity of care emerged. Primary activities were seen to be the most attention demanding. Care activities could be combined with other activities and this was deemed to be less intensive in relation to primary care activities performed singularly, but also set apart from time being with a child but not recording a childcare activity. Fundamental factors in variation in childcare are related to the children themselves. Two of these factors are the age of the youngest child and the number of children. Non-parametric and descriptive analysis showed that these states responded to variation in these variables in subtly different ways and the multivariate analysis provided more insight into the overall spectrum of care provided by mothers and fathers.

Comparisons of the three states suggest that the relationship between them was complementary i.e. if a respondent recorded a positive amount of combined care they recorded significantly more time doing undivided and non-specific care. All three states are therefore important. The relationship between the combined and non-specific care needs further investigation. It is suggested that by looking at children's and parents' diaries together much more can be learned. This study has shown that time use data can be used to delineate a clear spectrum of care. Although it is far from

complete it is an improvement on looking at activity diaries alone. Future research should try to build on this by articulating the measure so that time spent at the same location can be distinguished from time when the parent and child are in the same room together.

Appendix 1: OLS Results

Kan & Gershuny (2006) present a set of OLS regressions, which taken together comprise all activities a person can engage in throughout the day. The dependent variable in each regression is the total time spent in a particular activity. Their results clearly exhibit two important features of time use data. Firstly the sum of the coefficients in each regression, which are the same in all regressions, is zero. In other words a factor which increases the time in one activity must necessarily reduce the time in another activity. One can see clearly for example from their results that being a parent decreases time associated with labour market attachment; sleep, personal care, consumption and leisure and increases time in routine and other domestic work. Secondly, the sum of the intercept terms in their models is 1440 therefore all models taken together clearly account for the entire day. Table A1.1 below shows both these features. It reports OLS results for the same six models reported above using Tobit analysis. The results are not discussed as there is very little difference of substance between the two approaches.

Table A1.1: OLS Coefficients: Men and Women Pooled

<i>State</i>	1	1	1/2	2	2	3	NA	
Mothers	PCS (UDV)	DEV (UDV)	Accomp	PCS (COMB)	DEV (COMB)	Non-specific	Not With	SUM
Age	0.53***	0.60***	0.28**	0.77**	0.30*	2.00**	-4.47***	0.00
Age Youngest	-5.92***	-2.38***	-1.04***	-5.93***	-1.90***	-7.52***	24.68***	0.00
N. Adults	1.75	-3.13**	-3.75***	-3.85	-3.46*	-40.63***	53.08***	0.00
N. Child	3.65**	-0.89	3.66***	6.30**	-2.08	14.16*	-24.78***	0.00
No School Age	22.94***	7.07**	-7.76***	13.28*	5.47	2.96	-43.96**	0.00
No School Age GT 2 Child	36.95**	-3.77	15.87	237.70***	-3.78	-126.14	-156.83*	0.00
Lone Parent	0.72	-0.90	-1.80	-4.85	3.07	-46.88***	50.63***	0.00
Has a Degree	3.88	7.96***	0.52	15.98**	10.93***	9.65	-48.92**	0.00
Is a Higher Manager	1.90	-9.00**	-0.19	-1.67	-5.26	-14.07	28.30	0.00
Works on Diary day	-16.09***	-7.28***	-1.67	-24.25***	-7.60***	-149.05***	205.93***	0.00
Weekend	-10.13***	-5.66***	-17.85***	3.34	-2.16	49.29***	-16.83	0.00
Fathers								
Age	-0.24	0.19	-0.09	-0.01	-0.05	0.79	-0.60	0.00
Age Youngest	-2.30***	-1.51***	-0.36	-2.67***	-1.21**	-6.25**	14.30***	0.00
N. Adults	-2.87	-1.75	-1.58	-1.99	-3.14	-39.58***	50.91***	0.00
N. Child	-0.72	-0.31	0.49	-0.79	-1.33	4.99	-2.32	0.00
No School Age	1.67	2.94	-8.33***	-8.21	2.63	-35.73*	45.04*	0.00
No School Age GT 2 Child	33.67	-18.74	-5.90	149.09***	-20.49	-153.41	15.78	0.00
Lone Parent	-1.80	-3.30	-1.44	37.39**	4.34	-34.17	-1.02	0.00
Has a Degree	2.59	2.81	0.75	2.98	3.68	-11.56	-1.25	0.00
Is a Higher Manager	-0.22	-0.23	-1.58	3.75	-0.04	39.36**	-41.04**	0.00
Works on Diary day	-15.47***	-8.11***	-4.86***	-20.40***	-11.61***	-159.48***	219.93***	0.00
Weekend	-7.18**	1.48	-5.25***	0.64	4.29	72.11***	-66.09***	0.00
Constant	53.79***	19.79***	20.87***	51.88***	33.93***	360.07***	899.68***	1440.00
N	4763	4763	4763	4763	4763	4763	4763	
R2 (ADJ)	0.33	0.10	0.10	0.13	0.06	0.19	0.33	

Table A1.2: Statistical Comparisons of the Coefficients for Mothers and Fathers

	PCS(Sole)	DEV(Sole)	Accomp.	PCS(Comb)	DEV(Comb)	With	Not With
Age	12.08***	16.99***	7.08***	4.25*	2.78	4.02*	15.75***
Age of Youngest Child	206.04***	68.72***	14.65***	52.25***	23.12***	16.8***	115.37***
Number of Adults	2.14	5.19**	9.27***	1.06	4.25*	24.42***	32.07***
Number of Children	6.03**	0.58	12.82***	4.23*	1.86	3.08*	7.16***
No School age Children	35.88***	5.97**	14.72***	4.64**	1.92	2.69	8.57***
No School age Children: GT 2 Child	5.96**	0.92	2.04	51.99***	0.57	3.06*	2.28
Lone Parent	0.09	0.36	0.7	4.93**	0.95	7.26***	6.14**
Has a Degree	1.55	9.16***	0.14	4.76**	9***	0.58	5.06**
Is Higher Manager	0.1	3.98*	0.42	0.26	0.71	4.23*	4.05*
Works on Diary							
Day	62.2***	25.54***	6.99***	31.14***	20.97***	215***	318.88***
Weekend	23.24***	10.37***	137.6***	0.48	2.68	35.8***	14.95***

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