



# Harmonising extended measures of parental childcare in the time-diary surveys of four countries – Proximity versus responsibility

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## Abstract

Measures of childcare drawn from time-diary data are commonly based on the specific childcare activities a parent engages in throughout the day. This emphasis on activities has been criticised as it ignores the large quantity of time parents spend supervising their children. In order to provide more accurate estimates of childcare that incorporate supervisory childcare, researchers have turned to extended measures of care based on being i) in proximity to children or ii) responsible for children. There has been debate about the extent to which these approaches each measure the same aspect of childcare. In addition, it is thought they may be sensitive to the way surveys have been designed, which can affect the extent to which they can be compared cross-nationally. We argue that measures of proximity and responsibility are conceptually interchangeable, and demonstrate that they can be harmonised and compared cross-nationally. Finally, we suggest ways in which these extended measures of childcare can be made increasingly comparable cross-nationally.

**JEL-Codes:** D1, J13, J19

**Keywords:** Time-diary data, measurement of parental childcare, cross-national harmonisation of measures of childcare, time geography

## 1 Introduction

Time-diary data provides the source of information for much of the research on time parents spend caring for their children, and is regarded as providing valid and reliable measures of the time people spend performing a variety of day to day activities (Robinson, 1985), which have been used in the disciplines of economics (Juster and Stafford, 1991) and sociology (Gershuny and Sullivan, 1998). In particular, these data have been used to explore a wide range of questions about childcare, including the gender distribution of care (Craig, 2007), the types of care children receive (Bittman et al., 2004; Craig, 2006), differences in care patterns over time and cross-nationally (Bianchi et al, 2006; Gauthier et al., 2004; Gershuny, 2000) the impact of maternal employment on time with children (Hofferth, 2001), and estimates of the imputed market value of the household production of childcare (Ironmonger, 1996; Varjonen and Aalto, 2006).

Researching time devoted to children, however, is challenging because how to conceptualise it and (partly as a consequence) how to accurately measure it are both contested. Difficulties of measurement and conceptualisation have led some to argue that time-diary data are inadequate to the purpose because they are predicated upon the idea that our days consist of a sequence of main or “primary” activities that can be summed to 24 hours, and therefore miss a great deal of the complexities of care (Bryson, 2007; Budig and Folbre, 2004). Inter alia, it is argued that focusing on the sequence of primary activities is overly restrictive because a great deal of childcare time is devoted to minding or supervising children, often while doing something else at the same time.

This has led, in some quarters, to the use of measures based on being in proximity to children, or being responsible for children, as extended measures of childcare intended to capture more of the large body of time parents spend supervising their children (Budig and Folbre, 2004; Folbre and Yoon, 2007). That is, in addition to requiring respondents to record their main activities, some time-diary surveys ask them directly about time when they are responsible for a child, and others ask them to note who they are with (in proximity to). These approaches both yield extended measures of childcare.

There is little understanding, however, of how measures based on proximity and responsibility relate to each other. Is one superior to the other? Are they in fact measuring the same thing? That is, are these extended measures of childcare broadly commensurate, or are they fundamentally different? Answering this question is pre-requisite to meaningful cross-national comparison of extended measures of childcare from time-diaries.

In this paper, we compare proximity-based measures of childcare from time-diary surveys in Australia (1997), the UK (2000-01), Italy (2002-03) and the USA (2003), with a responsibility-based measure also from the USA (2003). We set out a conceptual discussion relating to

aspects of childcare that extended measures should capture and evaluate, in light of this discussion, whether the two approaches are commensurate or not. We conclude that they are conceptually interchangeable. We then investigate the extent to which features of survey design may impact upon the comparability of measures of proximity and responsibility across these countries. We conclude that if carefully harmonised, the proximity- and responsibility-based measures are comparable. We suggest ways in which this comparability could be further improved.

The remainder of this paper is organised as follows. In Section 2 we address issues related to the conceptualisation and measurement of parental childcare. We then describe the data, the harmonisation of measures of childcare, the sample and the plan of analysis in Section 3. Our results are discussed in Section 4 and Section 5 concludes.

## **2 Background**

### **2.1 Measuring childcare with time-diary data**

There are a number of ways to measure childcare using time-diary data. To begin with, the backbone of time-diary data is the sequence of primary (main) activities in which a respondent engages throughout a day. Applied to childcare, the record of primary activities captures care such as bathing, feeding, transporting, talking to, reading to, getting from school and putting to bed. Some time-diary surveys not only ask about primary activities, but also ask respondents what else they were doing at the same time, yielding information about secondary activities. Childcare as a secondary activity is commonly held to be synonymous with supervisory childcare because it is something that is often carried out whilst doing some other primary activity (Ironmonger, 2004; Pollack, 1999).

In addition to asking respondents about their primary and secondary activities, time-diary surveys ask respondents about the people they are with throughout the day. This is known as co-presence data and yields a third potential measure of childcare which is the total time that parents are co-present with children. This measure has been used in a number of studies of parental childcare (Bryant and Zick, 1996; Craig, 2006; Fernandez and Sevilla Sanz, 2006).

A fourth measure is derived from direct close-ended (yes/no) questions relating specifically to the care of children. The American Time Use Survey (ATUS) asked respondents to note if a child was ‘in their care’, whilst the Canadian General Social Survey (CGSS) 1998 asked respondents to indicate if they were ‘looking after’ a child. In each case, the respondent was ‘walked through’ the sequence of activities on the previous day in a telephone interview. The third and fourth measures have been described as measures of ‘proximity’ and ‘responsibility’ respectively (Budig and Folbre, 2004; Jones, 2008), and this is how they will be referred to throughout this paper.

Given such a variety of options, the question of how to best measure the time parents spend caring for their children, including supervisory childcare, with time-diary data has received much attention in the literature (see for example Allard et al., 2007; Budig and Folbre, 2004; Fedick et al., 2005; Folbre and Yoon, 2007; Folbre et al., 2005). The key findings of this research are that measures of primary activity childcare are the most suitable to compare cross nationally and over time, but that they are also significant underestimates of total care. Secondary activity measures capture more supervisory childcare, but variability in estimates across surveys has led to concerns about their reliability. Furthermore, using secondary activities to measure supervisory childcare is argued to also produce underestimates because of their activity-based nature. In contrast to these activity-based measures, measures of proximity and responsibility both yield estimates of childcare that are much more comprehensive. However, it is not known whether these measures are commensurate with each other.

## **2.2 Proximity versus responsibility**

### **2.2.1 Proximity versus responsibility – Some preliminary conceptual issues**

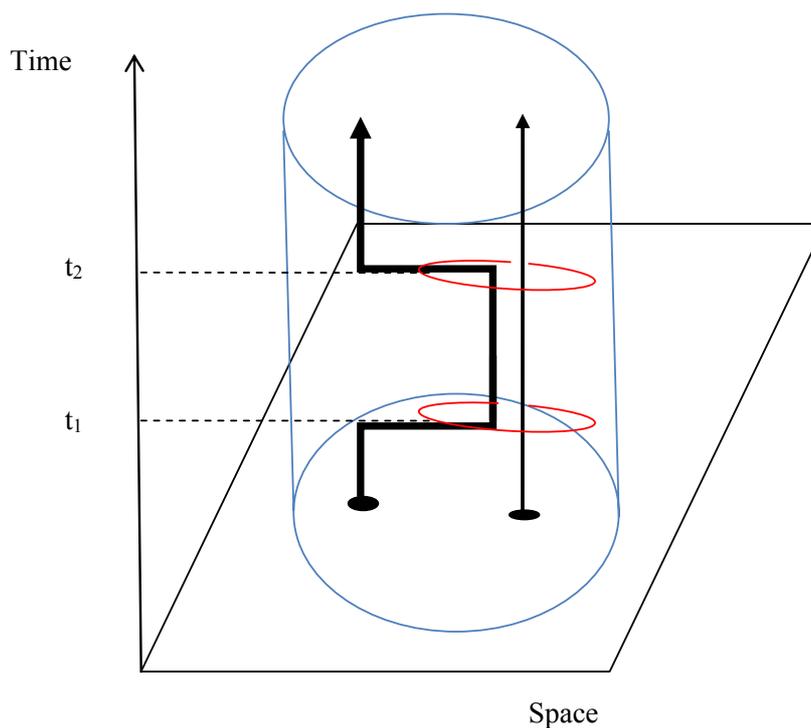
In this section we discuss some of the key conceptual aspects of parental childcare that are relevant when thinking about measuring it comprehensively. Our purpose is to explore the extent to which being near one's child and being responsible for one's child are conceptually commensurate.

Childcare does not only consist of activities. Creating an environment for children, keeping them safe, sensitively monitoring their needs and intervening as and when appropriate is a continual requirement within which specific actions, such as reading to a child or giving them a bath, are nested. To count only relatively brief specific childcare actions results in an underestimate of time allocated to children. It is also a misrepresentation of the care process as a whole. For example, from a mother's point of view, caring for a young child is not a series of discrete activities that intermittently claim her time, but when (for example) the nappy is changed or the meal provided, she can turn her attention from. It is a continual and pervasive requirement to provide a protective environment that is arguably her first order priority, the fact from which all else follows, the basis upon which she structures her time. This view of childcare requires us to think not just about what a parent is physically doing, but to think also about who they are near and the specific manner in which they maintain a protective environment for their children.

To illustrate this, we draw on aspects of the work of Hagerstrand (1970) and Giddens (1984). Hagerstrand argued that individuals' daily lives are constrained not only by time but also by space, and that the spatial constraints operate on a number of levels simultaneously. He developed 'time-space maps' to illustrate his ideas.

Figure 1 shows a representation of a time-space map. It contains two arrows that represent the movements of a parent (thick arrow) and a child (thin arrow) through space and time. The vertical sections of the arrows indicate movement through time at a fixed point in space, and the horizontal sections of the arrows indicate movement through space and time.<sup>1</sup> Figure 1 helps us to ‘visualise’ a comprehensive view of childcare. Suppose, for example, that a mother and child are at home and that up to  $t_1$  the mother is in the kitchen while the child is in another room. At  $t_1$  the mother moves to where the child is. The mother and child are then together in the same position from  $t_1$  to  $t_2$ , which is represented by the small cylinder enclosing both mother and child. Hagerstrand refers to these periods as ‘bundles’. Applied to childcare, these are the discrete activities carried out by mothers as part of the overall care they provide their children. We can imagine that the mother went to attend to the child in some way, to feed or dress them for example. After  $t_2$  the mother returns to the kitchen. In this particular example, the child’s position remains unchanged throughout.

**Figure 1**  
**Parental childcare – A time-geography map**



Source: Adapted from Hagerstrand (1970).

Also depicted in Figure 1 is a larger cylinder within which the discrete childcare activity described above took place, and which Hagerstrand refers to as a ‘domain’. Hagerstrand

<sup>1</sup> Strictly speaking, an upward-sloping diagonal line should be used to represent movement in both space and time.

describes this as a space where authority is exercised so as to control and/or protect individuals or things within it. In a purely physical sense, in the context of childcare, a ‘domain’ could, for example, encompass the entire family home as is the case in the above example. More generally, it represents a protective environment that parents provide for their children. A view of childcare that focuses only on discrete childcare activities would consider only the specific episode of childcare activity that began at t1 and ended at t2. This view fails to consider, however, the wider role of parents in providing a caring and protective environment for their children.

Hagerstrand’s theoretical insights illustrate the importance of considering spatial constraints as well as temporal constraints. His work helps to show how specific care activities can be nested within a broader ‘domain’, which can be understood here as a protective environment for children and which can extend beyond the immediate confines of a single room. There are more than simply physical aspects to this. A parent could not, for example, leave a child home alone. Rather, a childcare ‘domain’ is established as a direct result of the parents’ co-presence with the child. Even out-of-doors, a parent creates a protective space through being in proximity to the child. This means that the physical dimensions of the space are not the most important factor, but the proximity of the parent and child.

A major problem with Hagerstrand, however, is that he does not elaborate upon the role of the human agent (in this case the parent). As a result, we understand little of how parents create and maintain this protective space.

Giddens (1984) addresses this weakness in Hagerstrand’s work. He argues that people create and maintain situations of co-presence with others as part of a continual stream of reflexive monitoring of the ‘contextuality’ of daily life, and do so on a plane of awareness that he terms ‘practical’ consciousness. That is, much of daily life is routine, practical, and not explicitly examined. However, people could articulate what they are doing, and why, if they were asked to. That is, they could easily bring elements of their life from practical consciousness to what Giddens refers to as ‘discursive’ consciousness. People do not need to constantly explain the nature or purpose of their actions, their positioning in space or their proximity to others, but have the ever-ready potential to do so. This points to the reflexive nature of routine daily life operating continually on a level of practical consciousness.

Being in proximity to someone is not, therefore, only a physical matter, but rather an ongoing conscious process that an individual maintains in a reflexive manner. This provides for proximity to open up beyond the confines of a single room. Indeed, it is a conscious ‘opening up’ of the physical space which characterises much of the supervisory care that parents provide. One can think, for example, of a parents’ warning to children that they are being ‘watched’ even when they are not within eye contact.

The link between practical consciousness and maintaining proximity theorised by Giddens highlights an important connection between the two ideas of childcare as either responsibility or as proximity. The word ‘responsible’ can be used to denote a sense of purpose or agency

on the part of the parent who is conscious or mindful of the child's presence. Giddens helps us to understand that maintaining proximity with children is also purposeful and conscious, or mindful, on the part of the parent. In both cases we are extending our conception of childcare beyond specific childcare activities focusing on the conscious or mindful element of care. In addition and closely related to this, in both cases, our conception of childcare extends beyond the confines of a single room.

Measures of responsibility and proximity from time-diary surveys can be viewed as alternative approaches to capturing childcare that extends spatially beyond the confines of a single room, and also extends beyond specific childcare activities towards the more conscious or mindful element of childcare. Both aspects of an extended view of childcare are explicitly considered in the design of measures of proximity and responsibility included in time-diary surveys. We turn now to look at aspects of the design of measures of proximity and responsibility in time-diary surveys, and to other features of survey design with a potential bearing upon the extent to which these measures are commensurate.

### **2.2.2 Proximity versus responsibility: Issues concerning the design of measures in time-diary surveys**

Time-diary surveys require respondents to provide information relating to their time use on a specific day. The two main time-diary methods are a self-completed instrument and a telephone interview in which respondents are 'walked through' the previous day. Both these methods provide accurate and valid data on time use (Juster, 1985). Time-diary methodology is regarded as superior to asking respondents a stylised question about how much time they spend caring for children, known as the recall method (Gershuny, 2000; Robinson, 1985).

As well as information on activities, time-diary surveys ask respondents who they were with, which yields information about proximity. The surveys in all the countries included in this study (Australia, USA, Italy and the UK) ask respondents to indicate who they are with throughout the day. Therefore they all have 'proximity' measures. The only one of the four surveys that has a 'responsibility' measure is the American Time Use Survey (ATUS). The ATUS is a telephone survey and as respondents were walked through their previous day they were asked to state times during which a child was 'in your care'. This is the only survey included in this study that has such a measure. Appendix 1 summarises the measures available in the time-diary surveys included in this study.

Asking a parent if a child is 'in your care' is clearly different from asking them to record who they are co-present with. This raises a question as to whether they are substantively different measures. The discussion above suggests that to be commensurate such measures must i) extend spatially beyond the confines of a single room, and ii) extend beyond specific childcare activities to the more mindful element of childcare.

With respect to the first point, a criticism of proximity measures is that they may be inappropriate because they may restrict estimates of childcare to time when parents are in the

same room as children (Budig and Folbre, 2004; Folbre and Yoon, 2007). The ATUS, for example, explicitly restricts proximity measures to being in the same room. But such a restriction is the exception and not the rule. The ATUS is very unusual in imposing this constraint. The Australian Bureau of Statistics (ABS, 2003) defines proximity as “(a) those who were with the person when they were at home. This referred to all present in the house and grounds, whether belonging to the household or not, and (b) those for whom the person was responsible as well as those involved in the same activity when away from home (e.g. at a picnic, the person helping the respondent prepare the food, and others conversing with them and the associated children nearby).” Many of the European time-diary surveys define proximity in accordance with guidelines set down by Eurostat (Eurostat, 2004). These state that a person does not have to be engaged in an activity with another to be considered in proximity to them, but rather that they are “on hand”. Most surveys, therefore, do not stipulate that people must be in the same room to be regarded as in proximity to others. The responsibility measure in the USA was specifically designed cover situations where parents are not in the same room, but are ‘near enough to provide immediate assistance’ (Schwartz, 2001). In this very important regard, therefore, measures of responsibility and proximity are commensurate.

The second point, the conscious or mindful element of looking after children, is recognised by those seeking to develop extended measures of childcare. For example, the responsibility measure in ATUS refers to childcare as a ‘state of being *mindful* of and responsible for, a child’ (Schwartz, 2002). There is also, as discussed above, a spatial dimension as parents must be in proximity to their children, and this may extend beyond the confines of a single room. Further, the creation of this space is a conscious act on the part of parents who are mindful of being in proximity to their children. As noted previously, the Australian Bureau of Statistics (ABS, 2003) incorporates in their definition of proximity ‘those for whom the person was responsible’. This is a clear statement of the conceptual link between responsibility and proximity, which designers of the ABS time-diary survey obviously recognise. Finally, the Eurostat guidelines state that co-presence does not entail that the respondent be engaged in the same activity with another person (Eurostat, 2004). This is important as it clearly divorces the measure of proximity in recent European time-diary surveys from any relation to specific activities.

To summarise, when measures of proximity and responsibility are designed to extend beyond the confines of a single room then they ought to be commensurate. In addition, both capture the conscious or mindful dimensions of the care parents provide regardless of whether we think of this explicitly in terms of responsibility or proximity. The difference in the questions may not, therefore, be important especially as each question is designed to do the same thing. That is, to draw information from the practical consciousness of individuals on aspects of their daily routines.

One added point in relation to the design of the responsibility measure in the USA is that it is restricted to time when at least one child is awake, whereas respondents to the other surveys could record being in proximity to a child when all children in the household are asleep. The discussion above did not stipulate that children need to be awake to be receiving care. Indeed, the focal point of our measures is the parent who while awake is mindful of their children and consciously providing a caring protective environment. Restricting extended measures of care to time when at least one child is awake may affect the extent to which the responsibility measure in the USA is incommensurate with the measures of proximity in other countries.

There are a limited number of empirical studies comparing measures of proximity and responsibility, and researchers disagree on the implications of the findings. Fedick et al. (2005) compare estimates of proximity to estimates of responsibility from the Canadian General Social Survey (CGSS) 1998 mentioned above. They conclude that the differences in the estimates of proximity and responsibility are not substantial. Proximity in the CGSS 1998 is not restricted to being in the same room, and so the relative similarity between these two measures does suggest that they are quite commensurate. Folbre & Yoon (2007) argue, in contrast, that the differences between estimates of proximity and the estimates of responsibility are large enough to conclude that they “are related but distinctly different measures of child care.” It is difficult to draw a definitive conclusion on this issue from such a narrow base of empirical research.

A final issue that relates to survey design concerns the use of prompts in the secondary activity column of some time-diary surveys suggesting childcare as an example of a possible secondary activity. Recall from above that wide variation in estimates of secondary activities has led to some concern about their validity. Some have argued these specific prompts for childcare may be a factor leading to this wide variation in estimates of secondary activity childcare (Budig and Folbre, 2004; Folbre and Yoon, 2007). The suggestion is that prompts encourage respondents to say they were doing childcare as a secondary activity, and that the lack of a prompt does not mean that less secondary activity care is done, simply that less is recorded.

The use of prompts is of interest in this study because of the presence of temporal overlaps between different measures that we discussed above. Such prompts are a feature of survey design directly related to secondary activity measures, but they may be indirectly related to measures of proximity or responsibility as a result of temporal overlaps between different measures. In other words, a parent may record childcare as a secondary activity, as well as record being co-present with a child. The use of prompts in the secondary activity column may be a problem if overall estimates of proximity or responsibility are systematically larger in surveys where such prompts are used. The potential indirect impact of the existence of prompts in the secondary activity column of some surveys has not been examined in previous research.

## **2.3 Summary and research questions**

In broad summary, the discussion above highlighted that the care parents provide their children has a spatial dimension that extends beyond specific activities, and beyond specific places. Parents actively provide a safe environment for children to be in. This is done reflexively in a routine and ‘practically’ conscious manner. If parents are asked to comment on this feature of their daily lives they do can so. This can be by simply indicating the proximity of children, or can be elicited from responses to direct questions relating to parents’ responsibility for their children’s care. We have argued that these measures are conceptually interchangeable, and each is a theoretically valid way of capturing the large quantity of supervisory childcare parents provide.

Estimates of these measures, however, may be quite different as a result of survey design. The effects of survey design on estimates could be direct, as when in some surveys the measures extend beyond the confines of a single room and in others they do not. The effects of survey design could also be indirect, as when prompts for childcare are included in the secondary activity column of some surveys. Furthermore, restricting measures to certain periods in the day may also impair their comparability across surveys.

To test these possibilities, we harmonise and compare measures of proximity and responsibility from time-diary surveys in Australia (1997), the USA (2003), the UK (2000-01), and Italy (2002-03). Measures of proximity are available in all surveys used in the paper, whilst a responsibility measure is available in the USA survey only. (Appendix 1)

We address three questions relating to methodologies in the measurement of childcare with these data. These are:

- 1) Are measures of proximity designed to extend beyond the confines of a single room commensurate with a measure of responsibility that has also been designed to extend beyond the confines of a single room?
- 2) Do prompts in the secondary activity column of time-diaries bias estimates of extended measures of childcare upwards?
- 3) Does restricting the ATUS measure of responsibility to time when at least one child is awake affect the extent to which this measure is commensurate with measures of proximity in other countries?

## **3 Methodology**

### **3.1 Data**

We use time-diary data from Australia 1997 (AUSTUS), the USA 2003 (ATUS), Italy 2002-03 (ITUS) and the UK 2000-01 (UKTUS). All the surveys ask respondents about their main

activity yielding data on primary activities. All the countries except the USA ask respondents what else they were doing, which yields data on secondary activities.<sup>2</sup> The time-diary instruments in Australia and the UK each offer childcare as a suggestion in the secondary activity column. These are the prompts in the secondary activity column that we referred to above. All the countries ask respondents who they were with, which is a measure of proximity. The USA also asks respondents about time when a child was in their care, which is a measure of responsibility. (See the summary Appendix 1)

### **3.2 Measures**

When harmonising measures of proximity and responsibility, one of the most important factors to consider is the age of the children to which the measures refer. The time-diary instrument in the UK allows respondents to indicate if they are in proximity to children 0 – 9 years and 10 – 14 years. In Italy, respondents can indicate if they are with children 0 – 9 years. In Australia, proximity with children aged 0 – 11 years is specified, whilst in the ATUS measures of proximity can be constructed for children of any age. The ATUS responsibility measure, however, is restricted to children aged 0 – 12 years. To harmonise these measures, we adopt a ‘lowest common denominator’ approach restricting the analysis to households where the oldest child is aged 9 years. This means that the measures in Australia and the USA effectively cover children aged 0 – 9 years, and are thus comparable with the measures of time with a child aged 0 – 9 years in the UK and Italy. (This has obvious implications for sample selection which are detailed below.)

Surveys in the UK and Italy do not collect proximity information if the respondent is sleeping, in paid employment or engaged in education-related activities. To make the measures more comparable we apply this restriction to the proximity measure in Australia and the USA<sup>3</sup>, and the responsibility measure in the USA.

We create measures of total proximity in Australia, Italy, the UK and the USA. The measure in the USA is restricted to being in the same room. In addition, we create a measure of total responsibility in the USA. All these measure apply to children 0 – 9 years. In addition, they are all restricted to time when the parents are awake, not in paid work or engaged in education related activities.

Recall that our second research question addresses the potential impact of prompts in the secondary activity column in some surveys. For this, we divide the measure of responsibility in the USA, and the measures of proximity in the other three countries into three distinct components. These are: i) total primary activity childcare when in proximity to a child or

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<sup>2</sup> Although not asked in the ATUS, when volunteered by respondents secondary activity data is collected.

<sup>3</sup> Co-presence data is also not collected in ATUS if the respondent is sleeping or engaged in certain personal care activities. The personal care activities constitute a marginal quantity of time, and imposing this restriction in the other surveys is not straightforward because of differences in the detail of the coding of specific activities. Given that the quantity of time is minimal this does not have a strong bearing on substantive results.

responsible for a child ii) total secondary activity childcare when in proximity to a child or responsible for a child and iii) the remainder of time when in proximity to a child or responsible for a child

Note that the ATUS does not collect information on secondary activity childcare and so it is impossible to create this measure for the USA. The implications of this will be discussed when presenting the results below. In instances where a parent records both a primary and secondary childcare activity we only count the primary activity.

### **3.3 Sample**

All four surveys provide nationally representative samples. We restrict the sample to households where the oldest child is aged 0 – 9 years. As described above, this restriction enhances the comparability of measures of proximity and responsibility across countries. We further restrict the samples to households where the only adult residents are the mother and the father. This avoids complications arising from extra potential carers in households, and abstracts from the obvious differences that would arise in lone parent households. Table 1 shows the sample of mothers and fathers from each country. The country samples are reasonably well balanced by gender. The ATUS, UKTUS and ITUS each over-sampled weekend days, particularly in Italy where two thirds of the observations are weekend days.

**Table 1**  
**Numbers of observations**

	<b>Mothers</b>	<b>Fathers</b>
Italy	2,208	2,206
Australia	887	913
United States of America	1,365	1,236
United Kingdom	949	874

Source: Own calculations based on data from ATUS, UKTUS, AUSTUS and ITUS.

### **3.4 Analysis plan**

Our questions are methodological and our analysis is designed to illustrate the extent to which measures of proximity and responsibility may or may not be comparable.

To address the first question, we compare estimates of proximity in Australia, Italy and the UK, not restricted to being in the same room, with the estimate of proximity in the USA which is restricted to being in the same room. We then carry out a second comparison with measures of proximity in Australia, Italy and the UK and the measure of responsibility in the USA all of which are not restricted to being in the same room. This should, in a very simple manner, allow us to assess the extent to which measures of proximity in Australia, Italy and the UK which are not restricted to being in the same room are more comparable with the responsibility measure in the USA than with the proximity measure in the USA.

To address the second question, we examine the three parts of the measures of proximity in Australia, Italy and the UK and the measure of responsibility in the USA which are: 1) primary activity childcare, 2) secondary activity childcare, and 3) not performing a specific childcare activity. There are two components to our approach to this question. Firstly, we wish to know if prompts are systematically related to estimates of secondary activity childcare. To examine this, we compare estimates of secondary activity childcare in Australia and the UK, which each prompt for childcare in the secondary activity column, with Italy which has no prompt. This will allow us to assess the impact of such prompts on estimates of secondary activity childcare when with children. Secondly, we investigate if prompts are systematically related to estimates of proximity/responsibility more generally. By this we mean do they impact on other aspects of the measures such as, for example, time when no specific childcare activity is occurring. If prompts are systematically related to these measures in general, it should be apparent too for the component when parents are not engaged in any childcare activity, and would thus imply that prompts do have a detrimental impact on cross-national comparisons of measures of proximity/responsibility. To look at this, we compare the measures of proximity/responsibility net of any specific childcare activities.

To address the third question, we plot the average time per hour parents are in proximity to their children in Australia, Italy and the UK, and responsible for children in the USA. We look at average levels of this measure throughout the day for signs that the restriction of the measure of responsibility to times in the day when at least one child is awake, impacts on the extent to which it is comparable with the measures of proximity in the other countries.

For the first two questions, we estimate OLS regressions on the total measures of proximity and responsibility, and the three sub-components of these totals depending on whether the parent is also performing primary activity childcare, secondary activity childcare, or no childcare activity. We use these models to compute predicted means for the various measures, adjusted for several factors known to have a strong influence on the time parents spend caring for their children. We choose this option rather than reporting sample means as we do not have suitable weights available in all surveys. In addition, this approach allows us to test differences across countries.

The key variable of interest is the country the parent is in. We enter three dummy variables indicating if the respondent is living in Australia, Italy or the UK. Respondents from the USA are the reference group. The regressions control for age of youngest child (0-4 years omitted), number of children (one child omitted), whether the parent has a degree (yes=1), and the employment status of the parent. Employment status is grouped into three: 1) employed full-time (omitted); 2) employed part-time; and 3) not in employment. We estimate models for mothers and fathers separately as we are not primarily interested in gender differences. Standard errors are computed taking into consideration potential intra-group correlation arising from multiple observations for individuals in Australia and the UK. Regression output is reported in Appendix 1 below for mothers (Appendix 2) and fathers (Appendix 3).

## 4 Results

We begin by looking at estimates of the total measures of proximity in all countries, and the total measure of responsibility in the USA. Results contained in Table 2 show that the proximity measure in the USA, which is constrained to being in the same room, is considerably lower than the proximity measures in Australia, the UK and Italy where the proximity measure is not constrained to being in the same room.

In a clear answer to our first research question, the results here show that when measures of proximity are not restricted to being in the same room, then they do provide estimates of care that are commensurate with a more explicit responsibility measure.

**Table 2**  
**Mothers' and fathers' predicted average hours per day of proximity in USA, Australia, UK and Italy, and responsibility in USA**

	Proximity				Responsibility
	USA	Australia	UK	Italy	USA
Mothers	8.4 (1.5)	12.4 (1.4)	9.9 (1.4)	9.4 (1.5)	10.3 (1.6)
Fathers	5.5 (0.6)	7.6 (0.7)	6.4 (0.6)	6.1 (0.5)	6.6 (0.6)

Notes: Standard deviations in parenthesis.

Source: Own calculations based on data from ATUS, UKTUS, AUSTUS and ITUS.

For both mothers and fathers, the estimate of the restricted proximity measure in the USA is lower than the estimates of the proximity measures in all other countries and, perhaps more importantly, lower than the estimate of the responsibility measure in the USA. There is a difference of about two hours between the estimates of proximity and responsibility in the USA, the latter of which is designed to extend beyond the confines of a single room. The responsibility estimate in the USA is closer to the estimates of proximity in the other countries. The gap between mothers in the USA and Australia, for example, has halved from four hours to two hours. As we noted above, proximity measures in countries other than the USA are designed to extend beyond the confines of a single room and we conclude that respondents in these surveys are clearly indicating times when they are with children though not in the same room. Such proximity measures are therefore commensurate with the responsibility measure in the USA, with both capturing aspects of childcare that extend beyond the confines of a single room and beyond specific childcare activities.

The conceptual discussion above stressed that primary and secondary childcare activities are nested within extended measures of care. One implication of these temporal overlaps is that prompts relating to supervisory childcare in the secondary activity columns of time-diaries may lead to estimates of extended measures that are biased upwards. Recall that such prompts

are used in time-diary instruments in Australia and the UK. Our second research question asks if these prompts affect the comparability of extended measures. To answer this, we decomposed the entire time parents are in proximity to a child or responsible for a child depending on whether they are doing a primary childcare activity, a secondary childcare activity, or not doing any childcare activity. Table 3 reports the predicted means from regressions on time in each of these three distinct components of the overall measures of proximity in Australia, the UK and Italy, and the measure of responsibility in the USA.

**Table 3**  
**Mothers' and fathers' predicted average hours per day of primary childcare activities, secondary childcare activities, and no childcare activities when in proximity to a child in Australia, the UK and Italy, or responsible for a child in the USA**

	Proximity			Responsibility
	Australia	UK	Italy	USA
<i>Mothers</i>				
No childcare activities	5.7 (0.8)	6.2 (0.7)	6.4 (0.8)	7.8 (0.8)
Primary childcare activities	3.1 (0.7)	2.4 (0.7)	2.4 (0.7)	2.6 (0.7)
Secondary childcare activities	3.6 (0.2)	1.3 (0.2)	0.6 (0.2)	- -
<i>Fathers</i>				
No childcare activities	5.0 (0.5)	4.7 (0.4)	4.7 (0.3)	5.3 (0.4)
Primary childcare activities	1.2 (0.3)	1.1 (0.3)	1.0 (0.3)	1.3 (0.3)
Secondary childcare activities	1.4 (0.1)	0.6 (0.1)	0.3 (0.1)	- -

Notes: Standard deviations in parenthesis.

Source: Own calculations based on data from ATUS, IKTUS, AUSTUS and ITUS.

It is clear from results in Table 3 that cross-national variation in estimates of total proximity for mothers is largely concentrated in time when they are also performing secondary activity childcare. It seems unlikely, however, that variation in estimates of secondary activity care are related to the use of prompts in the secondary activity column in the time-diaries in Australia and the UK. It is true that the estimates of secondary activity childcare are larger in Australia and the UK than in Italy where no prompt is used. For example, the estimate of secondary activity childcare for the UK is about twice as large as the Italian estimate. But it is also the case that the estimate in Australia is about three times larger than the UK estimate. Given that both these countries prompt respondents about supervisory childcare, we cannot attribute the difference between them to the use of such prompts.

We further inquire if the prompts are systematically related to measures of proximity in general. If this were the case, then it should be apparent in other components of the measures including when not engaging in any childcare activities. The results do not suggest this. Estimates of proximity net of specific childcare activities, and estimates of primary activity childcare when in proximity to a child or responsible for a child are broadly similar cross-nationally. In fact, the estimate of proximity net of care activities is largest in Italy (the USA is discussed below), which has the lowest estimate of secondary activity childcare and no prompt. These results suggest variation in estimates of secondary activity childcare mimic those for overall time caring for children, and are not an artefact of survey design.

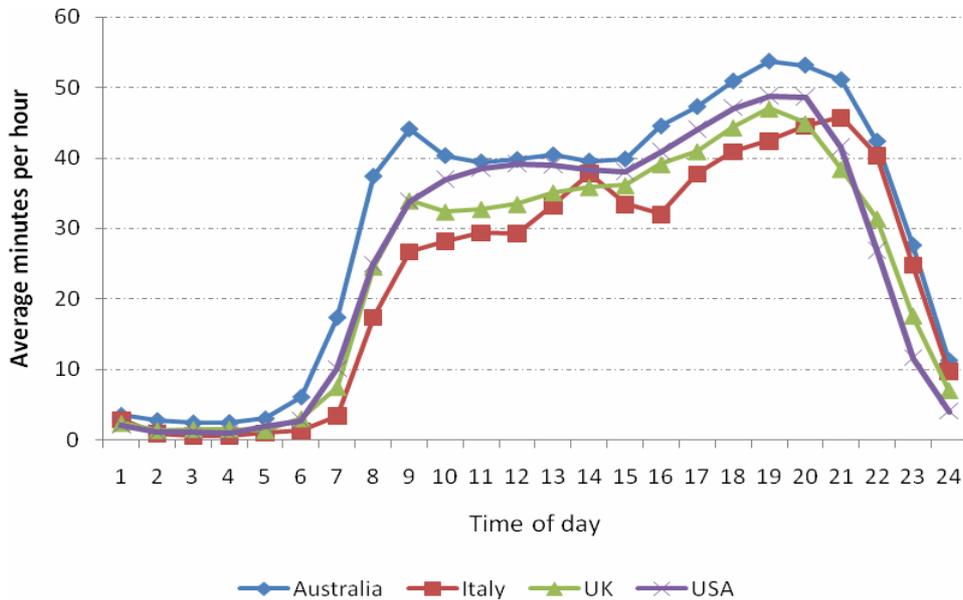
Information on secondary activity childcare is not systematically collected in the ATUS. At the same time, the responsibility estimate net of childcare activities for mothers in the USA is larger than estimates of proximity in the other countries. We suggest that secondary activities, if systematically collected, were subtracted from this measure then it would be more similar to the estimates of proximity net of childcare activities in the other countries. For this to be the case, the assumed estimate of secondary childcare in the USA would have to be in a range of about 1.4 to 2.1 hours. Considering the estimates of secondary activity in the UK and Australia, this is reasonable.

#### *The timing of measures of proximity and responsibility*

Recall that the ATUS responsibility measure is not collected when children are sleeping, which may limit the extent to which this measure is commensurate with proximity measures in the other countries, which are not restricted in the same manner. There is no conceptual rationale for such a restriction, and our third research question asks if it limits the comparability of measures. To explore this, we look at the timing of these measures throughout the day. We compute 24 distinct measures of proximity/responsibility time for each hour in the day and then plot the sample means at each time point to form a tempogram. Figure 2 is the tempogram for mothers and Figure 3 is the tempogram for fathers.

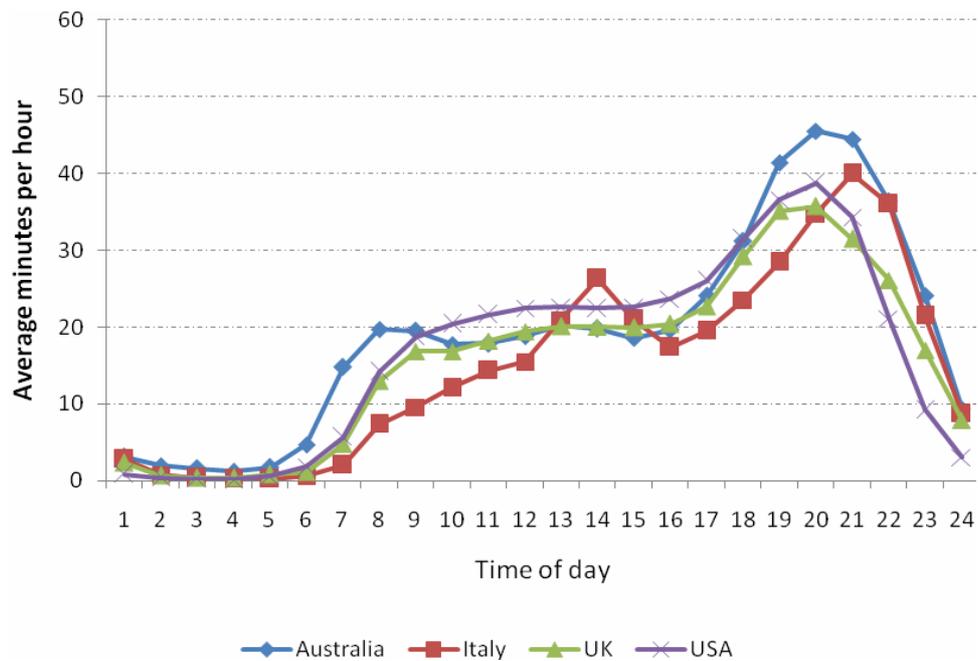
The times most likely to be affected by restricting the ATUS responsibility measure to only when children are awake are early in the morning and late in the evening. Looking first at the morning time (up to 10am), there is little evidence to suggest that the measure of responsibility in the USA is systematically different from proximity measures in the other countries. The average time per hour in the USA is almost identical to that in the UK up to about 9am for mothers, and 8am for fathers. The average time for Australia and Italy are higher and lower respectively, than the other countries. Cross-national patterns in the early morning echo those prevalent when averaged over the entire day. It is perhaps to be expected that this restriction would not have much of an impact in the morning as parents and children tend to get up together, especially when the children are younger.

**Figure 2**  
**The timing of mothers' proximity measure in Australia, Italy and the UK, and responsibility measure in the USA**



Source: Own calculations based on data from ATUS, UKTUS, AUSTUS and ITUS.

**Figure 3**  
**The timing of fathers' proximity measure in Australia, Italy and the UK, and responsibility measure in the USA**



Source: Own calculations based on data from ATUS, UKTUS, AUSTUS and ITUS.

Figures 2 and 3 show that the estimates of proximity and responsibility peak in the evening for mothers at around 7pm and for fathers at around 8pm and decline thereafter (Italy is an exception, which we discuss below). After 9pm there is a sharper drop in the average time per hour that parents in the USA state being responsible for children, such that this is lower than the average estimates of proximity per hour in all other countries. This is the only time in the entire day where the estimate of responsibility for the USA falls below the estimates of proximity in all the other countries. This shows that the timing restriction does have a modest impact on the measure of responsibility in the evening that makes it slightly less comparable with measures of proximity in the other countries.

One option to make the responsibility measure more comparable with proximity measures would be to assume that the ‘trajectory’ of the estimate of responsibility in the USA follows that of the country it is most similar to over the day, which would be the UK. This would obviously increase the overall estimate in the USA, moving it closer to the estimate in Australia, but the substantive findings set out above would remain intact. An alternative proposition would be to ignore proximity later in the evening as children are more likely sleeping. One major reason for not following this approach concerns Italy. For both Italian mothers and fathers, time with children is concentrated more towards evening. It peaks at around 9pm. This very likely reflects cultural differences in the temporality of family time in Italy compared with the other countries analysed here. If we were to ignore proximity later in the evening, results would likely be biased against Italian households.

## **5 Conclusion**

Childcare is difficult to measure because so much of it occurs in a routine fashion, continuously, as a ‘matter of course’ throughout the day. Supervisory childcare is often combined seamlessly, though not effortlessly, with other activities that appear, at least on the surface, to be of primary importance. Therefore time-diary measures which capture only specific activities miss a great deal of care, and research attention has turned to ways in which the large amount of supervisory childcare parents provide their children might be tapped. Most surveys gather information on whether parents are in proximity to children, and some include specific direct questions as to when parents are responsible for children. We argued that these two approaches are conceptually interchangeable. We then discussed particular features of survey design that may affect whether these measures are indeed comparable cross-nationally. We set out three specific methodological research questions.

Our first research question was whether the comparability of extended measures of childcare is affected by restrictions that confine them to a single room. Most surveys do not restrict measures of proximity to being in the same room, and this is a clear advantage in capturing supervisory childcare. Not surprisingly, we found that a measure of proximity restricted to being in the same room had lower estimates than measures of proximity when no such

restriction was applied. The differences are not huge, but enough to suggest that restricting the measure of proximity to being in the same room has an impact on the comparability of this measure cross-nationally. Moreover, measures of proximity that are not restricted to being in the same room were comparable in magnitude with the measure of responsibility. We conclude that measures of proximity that are not restricted to being in the same room as children capture parental childcare viewed broadly as looking after, that is providing a protective environment for, children and are commensurate with measures of responsibility which were explicitly designed to capture this dimension of childcare.

Our second research question concerned the use of prompts in the secondary activity column and whether they impacted on estimates of extended measures of childcare. Our approach to this question had two components. Firstly, we compared estimates of secondary activity childcare. We found that while there were large differences in secondary activity childcare these could not be linked to the use of prompts for childcare. Both Australia and the UK, which each prompted for childcare, had larger estimates of secondary activity childcare than Italy which did not prompt for childcare in the secondary activity column. But there was a large difference in the estimates between Australia and the UK. This leads us to the second component of this question: Are these prompts related to measures of proximity more generally? We compared estimates of proximity net of all childcare activities and found that they were remarkably similar across countries. This suggests that measures of proximity are not affected by the use of prompts in the secondary activity column in some surveys. We therefore conclude that cross-national differences in estimates of secondary activity childcare mimic cross-national differences in the overall time parents are with their children. In other words, these are substantive differences and not an artefact of survey design.

Our third research question was whether there were limits to the comparability of the responsibility measure because it was restricted to time when at least one child is awake. We found that this restriction does modestly affect the measure, most notably in the evening. We conclude that these measures are sensitive to such restrictions and future time-diary surveys should be mindful of this. One of the limitations of the paper arises from cross-national variation in the age brackets of children that extended measures of childcare cover. This meant that we had to restrict our analysis to families where the oldest child was nine years of age. Time-diary surveys have made considerable progress in harmonising activities. Future surveys should try to harmonise the age brackets for children in extended measures of care. There has been some movement towards this in the Harmonised European Time Use Survey (HETUS), but there remains variation. The Italian and UK data both had a bracket for children 0 – 9 years, but the UK alone had a further bracket for children 10 – 14 years. Harmonised age brackets are crucial to further develop extended measures of care from time-diary data that are comparable across countries.

Our comparisons did not include measures of childcare derived from survey questions asking respondents to recall how much time they spend caring for children. These have been the

subject of research comparing these measures with measures from time-diary surveys (Fedick et al., 2005), and comparing estimates of these recall-based measures cross-nationally using the European Community Household Panel (Joesch and Spiess, 2006). Joesch and Spiess reported that mothers in the UK spent about 70 hours per week ‘looking after’ their children in 1996. This is quite similar to the estimate of proximity for mothers reported here of 9.9 hours per day, which is about 70 hours when summed over a week. There are some differences between the samples used in their study and ours, but this simple comparison does suggest that these measures provide similar estimates to the broader measures of proximity and responsibility from time-diary surveys discussed in this paper. However, as noted above, time diary data are widely acknowledged to be superior to stylised estimates. Time-diary data are less prone to social desirability bias. They have the added advantage that one can study the timing of care across the day and, perhaps more importantly, examine periods when more than one dimension of childcare is occurring simultaneously. They can be analysed in conjunction with other aspects of time allocation including leisure, market work and domestic labour. They also capture further social dimensions to providing childcare, such as whether parents are caring alone or with a spouse.

This paper has shown that extended measures of childcare, which incorporate supervisory childcare, can be derived from time-diary data and compared cross-nationally. The most common extended measure available in time-diary surveys is the time parents are in proximity to their children. Provided this measure is not restricted to being in the same room, it has been shown here to be commensurate with a responsibility measure in the USA that was explicitly designed to capture supervisory care. This is an important finding as it opens the way for future comparative studies on these comprehensive measures of childcare using time-diary data. Harmonised time-diary surveys such as the Multi-national Time Use Survey (MTUS) or the Harmonised European Time Use Survey (HETUS) are currently restricted to primary activities, and it is to be hoped that future versions of these surveys will incorporate measures of proximity that are common to time-diary surveys. This paper highlights how important this aspect of time-diary surveys is for the measurement of childcare, and shows how such measures can be harmonised creating the potential for future comparative research.

## Appendix

### Appendix 1

#### Summary of measures available in the time-diary surveys included in the paper

	Australia (1997)	USA (2003)	Italy (2002-03)	UK (2000-01)
Primary activity	√	√	√	√
Secondary activity	√	X	√	√
Prompts for secondary activity	√	-	X	√
Proximity	√	√	√	√
Proximity restricted to being in the same room	X	√	X	X
Responsibility	X	√	X	X
Responsibility restricted to being in the same room	-	X	-	-

Notes: √ = Yes; X = No.

Source: Own calculations based on data from ATUS, UKTUS, AUSTUS and ITUS.

**Appendix 2**  
**OLS results for mothers**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b> no childcare activity	<b>Model 4</b> primary childcare activity	<b>Model 5</b> secondary child- care activity
Australia	6.3*** (0.2)	1.8*** (0.2)	-2.3*** (0.2)	0.5*** (0.1)	3.6*** (0.1)
UK	4.1*** (0.2)	-0.4 (0.2)	-1.8*** (0.2)	0.0 (0.1)	1.3*** (0.1)
Italy	3.7*** (0.1)	-0.8*** (0.2)	-1.6*** (0.1)	0.0 (0.1)	0.7*** (0.0)
Youngest child 5 - 9 years	-1.8*** (0.1)	-1.8*** (0.1)	-0.2 (0.1)	-1.3*** (0.1)	-0.3*** (0.1)
Two children	1.0*** (0.1)	0.4*** (0.1)	0.1 (0.1)	0.3*** (0.1)	0.1 (0.1)
> 2 children	1.7*** (0.2)	1.0*** (0.2)	0.4 (0.2)	0.6*** (0.1)	0.0 (0.1)
Has a degree	0.2 (0.1)	0.2 (0.2)	-0.5*** (0.1)	0.5*** (0.1)	0.2** (0.1)
Works part time	0.7*** (0.2)	0.9*** (0.2)	0.5*** (0.1)	0.2* (0.1)	0.3*** (0.1)
No paid employment	2.1*** (0.1)	2.6*** (0.1)	1.6*** (0.1)	0.6*** (0.1)	0.4*** (0.1)
Intercept	4.6*** (0.2)	9.1*** (0.2)	7.2*** (0.2)	2.1*** (0.1)	-0.3*** (0.1)
Number of observations	5,409	5,409	5,409	5,409	5,409
Adjusted R <sup>2</sup>	0.29	0.16	0.08	0.14	0.30

Notes: Standard errors in parenthesis. \*\*\* P < .001; \*\* P < .01; \* P < .05. Model 1 compares the restricted proximity measure in the USA with the measure of proximity in all other countries. Model 2 compares the responsibility measure in the USA with the measure of proximity in all other countries. Models 3 – 5 refer to the three components of the responsibility measure in the USA, and the proximity measure in Australia, Italy and the UK.

Source: Own calculations based on data from ATUS, UKTUS, AUSTUS and ITUS.

### Appendix 3 OLS results for fathers

	Model 1	Model 2	Model 3 no childcare activity	Model 4 primary childcare activity	Model 5 secondary child-care activity
Australia	3.0 *** (0.2)	1.0 *** (0.2)	-0.3 (0.2)	-0.2 * (0.1)	1.5 *** (0.1)
UK	1.9 *** (0.2)	-0.1 (0.2)	-0.6 ** (0.2)	-0.2 * (0.1)	0.7 *** (0.0)
Italy	1.8 *** (0.2)	-0.2 (0.2)	-0.5 ** (0.2)	-0.1 * (0.1)	0.4 *** (0.0)
Youngest child 5 - 9 years	-0.5 *** (0.1)	-0.4 * (0.2)	0.2 (0.1)	-0.5 *** (0.0)	-0.1 (0.0)
Two children	0.5 *** (0.1)	0.4 ** (0.1)	0.2 (0.1)	0.2 *** (0.0)	0.0 (0.0)
> 2 children	0.4 * (0.2)	0.3 (0.2)	0.1 (0.2)	0.1 (0.1)	0.1 (0.1)
Has a degree	0.5 ** (0.2)	0.6 *** (0.2)	0.0 (0.1)	0.4 *** (0.1)	0.2 ** (0.1)
Works part time	0.7 * (0.4)	1.0 * (0.4)	0.3 (0.3)	0.4 ** (0.1)	0.3 * (0.1)
No paid employment	1.9 *** (0.3)	2.2 *** (0.3)	1.6 *** (0.3)	0.5 *** (0.1)	0.0 (0.1)
Intercept	4.1 *** (0.2)	6.1 *** (0.2)	5.0 *** (0.2)	1.2 *** (0.1)	-0.1 ** (0.0)
Number of observations	5,229	5,229	5,229	5,229	5,229
Adjusted R <sup>2</sup>	0.07	0.03	0.01	0.05	0.15

Notes: Standard errors in parenthesis. \*\*\* P < .001; \*\* P < .01; \* P < .05. Model 1 compares the restricted proximity measure in the USA with the measure of proximity in all other countries. Model 2 compares the responsibility measure in the USA with the measure of proximity in all other countries. Models 3 – 5 refer to the three components of the responsibility measure in the USA, and the proximity measure in Australia, Italy and the UK.

Source: Own calculations based on data from ATUS, UKTUS, AUSTUS and ITUS.

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