



# Activity and contextual codes – Implications for time-use coding schemes

Andrew Harvey and Jamie Spinney

Andrew S. Harvey  
Department of Economics  
Saint Mary's University  
Halifax, NS, Canada B3H 3C3  
e-mail: Andrew.Harvey@smu.ca

Jamie E. L. Spinney  
Department of Geography  
Saint Mary's University  
Halifax, NS, Canada B3H 3C3  
e-mail: Jamie.Spinney@smu.ca

## Abstract

Time-use studies are designed to picture human behaviour as it is played out day by day. That behaviour has many dimensions, with the main activity usually playing the starring role. However, activity context, where people are, whom they are with, “for whom” they are performing an activity, and how they feel about it can be equally, if not more, important. In reality the experience of living is the concurrent experience of all of these. Traditional activity definitions and grouping exhibit a mélange of “activity” codes developed a priori using the several dimensions based on preconceived activity expectations. Contextual dimensions are examined in a brief review of the origin and development of coding practices and major studies identifying problems at the data capture, coding, and analysis levels. A potential remedy is to be found in contextual coding, which could improve the outcome at all three stages. An alternative contextual approach, the incorporation of a “for whom” column in the diary, is recommended. Data collected from Nova Scotia teachers using two diary versions are presented to provide some insight into its use. Results differ both quantitatively and qualitatively. This approach added to both the number of work activities and the total amount of work time.

**JEL-Codes:** B41, C81, D03, J22

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## **1 Introduction**

In spite of the long history of time use studies the definition and grouping of activities to reflect human behaviour continues to demand considerable thought. Generally, the perspectives of economists, sociologists, psychologists, and city planners, among many others, seek quantitative and qualitative knowledge of people's use of time. Decision makers need such knowledge to guide decision making. The task facing time use researchers is to design studies that can provide meaningful and usable data for these diverse demands. This paper draws on time use studies of teachers in Nova Scotia (Harvey and Spinney, 2000a; Harvey and Spinney, 2000b; Harvey and Spinney, 2001) undertaken to provide factual insight into the realities of teachers lives. Based on that experience and identified shortcomings in typical theoretical and applied approaches to data collection and classification an alternative collection regimen is recommended for consideration.

Greater attention needs to be paid to the identification and collection of required activity and contextual data in a structure that facilitates optimal accuracy while minimizing respondent/interviewer confusion and burden. Data collection and coding are different stages in the research process. Collection should be optimized to capture the events of daily life so that they can be classified in a manner that permits, thru manipulation, the formation of constructs required for description and analysis of time related phenomena in a broad range of disciplines. The analytical structures required by various disciplines and decision makers can then be constructed at the analysis and reporting stage.

In undertaking the teachers study the challenge was to develop a self-administered diary instrument that would show, in context, the daily behaviour of school teachers and administrators. This required identifying and integrating relevant and meaningful activities and contextual elements to portray the reality of their daily lives on and off the job. The time diary approach offers many benefits but at least three stand out. First, time diaries address the reality that each activity occurs within a multi-dimensional context including other activities. Second, they provide an accounting framework that enhances the usefulness and validation of the data. Third, they provide analytical hooks to population based data that can be utilized to validate the data and enhance analysis. The Survey of Nova Scotia Teachers was designed with these benefits in mind by building a framework drawing on the Canadian General Social Survey (GSS) time use study.

## **2 Background**

The foundation of time use data collection was laid with the development and execution of the Multinational Time Use Study in the mid 1960s (Szalai, 1972). At the practical level it adopted

a coding scheme incorporating everyday language while at the same time addressing systematic concepts arising out of the theoretical interests of the designers (Szalai, 1972). It was built on ten major activity groups and provided the template for the vast majority of time use studies to the end of the last century.

Over time, time use coding schemes have drawn on a wide variety of perspectives. Among those making contributions to the literature are Patrushev (1961), Govaerts (1969), Javeau (1970), Swedner (1970), Szalai (1972), Clark and Harvey (1977), Ås (1978), Elcardus and Glorieux (1993), Harvey and Niemi (1994), Bedakio and Vanek (1999), EUROSTAT (1999), Hoffman and Mata (1999), and Shelly (2005). In addition, each new time use study has made some alteration/ contribution to coding practice.

The Multinational Study classification was built on ten major groups designed to facilitate collection and provide for disciplinary research needs. Theoretically Swedner (1970) identified five groups (i.e. physiological, free-time, household, family, and economic) while Ås (1978) identified four (i.e. necessary, free, committed and contracted). The Multinational Study classification scheme elaborated all 10 groups providing for up to ten subcategories in each. Swedner's classification incorporated several dimensions in a single activity and was elaborated in all behavioural areas. Ås, primarily interested in leisure, only expanded free time. Over time, with the growing use of computer assisted interviewing, code elaboration has increased.

Two decades later statistical agencies began to take seriously, among others, two realities that have contributed to classification expansion; momentum and shape. First, the need to obtain accurate and comprehensive time use data to facilitate the measurement of non-market production (Chadeau, 1992). Second, the need to capture more meaningful work time data to inform labour legislation to protect the rights of workers, recognizing that working time directly affects workers health, stress levels, the establishment's productivity and costs and overall societal quality of life (Mata-Greenburg, 1992).

As early as the mid 1970s the need to provide more disaggregated time use data for economic measurement was noted from both theoretical (Juster, 1973) and methodological (Harvey and Macdonald, 1976) perspectives. By the 1990s growing demands to value non-market production and properly measure labour time in both developed and less developed societies, made these needs more pressing.

### **3 Classification building blocks**

Givens in capturing and recording the flow of daily behaviour are: the functional unit captured in the diary known as the event or episode, the behavioural unit (i.e. activity), which is used along with other contextual information to classify the action (i.e. behavioural unit), and the behavioural groups that are designed to provide a theoretical structure and facilitate collection. There are two types of contextual information needed for accurate classification, "situational" (e.g. where, with whom, for whom), which are applicable to all events, and "activity deter-

mined” (e.g. mode of transport, material read, communication technology) that apply, and are often unique, to particular activities (Harvey and Royal, 2000).

### **3.1 Events**

Einstein defined an event as something that happens in time and space. Life is a series of events, lived as a stream of behaviour (Barker, 1968), which is manifest in activities housed in and shaped by a flow of objective and subjective contexts. Hence, events are the basic building block structuring an individual’s day. An event in the Multinational Study contained information on time slot, what, what else, where, and with whom. Technically a new event was triggered when any one of its dimensions changed. For example, having breakfast alone is a different event after a spouse enters. The event is the heart of time use studies and should contain all contextual information, within response burden limits, that facilitates its collection, defines it, and gives it meaning.

The 2006 Australian Time Use Study captures both situational and activity determined contextual dimensions. As appropriate, an event can contain: time; primary activity; secondary activity; for whom; location (both physical and spatial); mode of transport; technology/communication code where relevant; social contact; age details of any household members present; and, health details of any household members present (ABS, 2008). The event level information is captured in a diary form in the respondents own words.

### **3.2 Behavioural units – Activities**

The concrete and observable “behavioural unit” (activity) must be given priority in the classification process. A list of discrete activities that are essentially independent of the context in which they occur is needed (Ås, 1978; Elcardus and Glorieux, 1993; Harvey and Niemi, 1994). Overt activities are “behavioural units” reflecting “what” expressed by a verb (e.g. eating, teaching, buying, reading) and typically accompanied by a noun, an object of the action (e.g. breakfast, class, groceries, cars, newspaper). Predominantly natural language defines the “behavioural unit”. In the initial stage the key is to clarify for both the respondents and interviewers the information needed and establish a framework that will accurately, parsimoniously, and comfortably capture the stream of activity throughout the day. It is necessary to draw a distinction between overt acts on one hand and the meaning that can be attached to them on the other.

A coding scheme gives events meaning through assignment to a “behavioural (activity) group” (Harvey and Niemi, 1994). At the collection stage attention to the ultimate behaviour groups need only relate to any contribution groups may make to the accuracy and efficiency of data capture. Once captured in natural language, the contextual information can be used to assign activities to “behavioural groups” as required by various theoretical and operational needs. A review of the examples in the ATUS Coding Lexicon illustrates the role of natural language and the heavy dependence on “for whom” information in distinguishing activity placement in the ATUS scheme (Bureau of Labor Statistics, 2011b). Ideally, a verbatim record of the re-

spondent's activity description would be maintained along with the code, thus allowing for verification and reassignment as may be required for reporting and analysis.

Chapin (1974) identifies two approaches to classifying activities, a basic research approach that seeks the meaning of the activity to the subject and one that designates activities in terms of their meaning for suppliers of specific services and facilities. From this perspective disciplinary demands parallel the suppliers' perspective. For example, a hobbyist sees making a ceramic bowl as a leisure activity and an occupational therapist may see it as therapy. However, a national accountant sees it as non-market work included in gross national product. Activities must be amenable to assignment to a broad set of meanings.

Examining the meaning of activities to the individual, Elcardus and Glorieux (1993) argue that a semantic taxonomy of activities should comprise four things: an initial list of lexically defined activities; a set of meanings used to classify them; a set of rules for the classification; and, an estimate of the degree to which the lexically defined activities are true to their meanings. In an empirical test of the meaning attached to activities they found that, knowing the activity and its context (e.g. timing, location, and interaction partners), schemes they examined performed fairly well in distinguishing variation in the general meaning of activities. However, they concluded that if one is interested in the meaning individuals attach to an activity (behavioural unit) the meaning needs to be measured explicitly.

This is consistent with findings that show a given activity may have different meanings for men and women and that for a given person an activity may have one meaning in one context and a different meaning in a different context (Clark et al., 1990). In one study more than half of the market/non-market work activities, objectively coded work using a traditional coding scheme, were viewed as leisure, on a work-leisure continuum scale, by its doer (Harvey, 1993). Meanings that others (suppliers, disciplinary demands) attach to activities may be independent of the meaning attached by the individual thus requiring additional data and alternative behavioural groups. The content of the event determines the range of classification possibilities.

Harvey and Niemi (1994) identify five classification principles. A classification scheme should provide a hierarchical structure, ideally a single frame of reference, familiar terminology, definability in terms of specific criteria, and the ability to distinguish defined activities. They make the point that coding should be a classification not a data reduction exercise. The basic structure for the hierarchy is provided by behavioural areas (activity groups).

### **3.3 Behavioural areas – Activity groups**

Behavioural areas provide a meaningful framework to the behavioural units. Any framework reflects underlying assumptions about human behaviour from both intuitive and disciplinary perspectives. Behavioural areas can provide both an instinctive means of reporting events and a template for the data required, thus helping to ensure that necessary contextual variables and categories are captured. A given activity may mean different things to different people or to the same person at different times. Hence, it is best to ensure that the behavioural groups provide a

structure that is meaningful to respondents and interviewers, thus enabling them to faithfully reflect the behaviour in context. There are some shortcomings of such an applied behavioural framework: the motivation or outcome may depart from that which is theorized; specific acts may fit into the framework in more than one place; and, the information available may be insufficient to properly reflect relevant motivations or outcomes. These shortcomings can be minimized in two ways. The first is to ensure that necessary contextual variables are collected with a level of detail that provides optimal flexibility at the coding stage. The second is to avoid data reduction when coding the data.

Activity dimensions are, typically, “what”, “where”, and “with whom”. “For whom” (purpose) and, ideally at least one subjective dimension, should be added. In terms of “for whom”, there is an overriding need to distinguish, behaviourally, between economic and non-economic activity in order to measure total societal production. A time use coding scheme must record faithfully what a person is doing, independently from the motivation for doing it (Harvey and Niemi, 1994) or the contractual arrangements under which it is done (Hoffmann and Mata, 1999). Unfortunately, to date most coding schemes have failed to achieve this.

### **3.4 Coding schemes**

The Multinational Time Use Study (Szalai, 1972), as noted above, provided primary guidance for the construction of most time use coding schemes following its implementation. It did so because it reflected, to put it simply, the basic human activities work, rest, and play; and the basic economic and social information needed by its creators. However, the Multinational coding scheme was not designed to provide a picture of general population time use. It was designed to examine differences among individuals living in households with someone engaged in non-agricultural employment in narrowly defined industrial communities.

In spite of the exclusions the Multinational classification proved functional and permitted extensive opportunities for analysis and comparison and has moulded the structure of virtually all existing national time use coding schemes. The Multinational coding scheme had two main advantages and two main disadvantages. Its advantages were the analytical opportunities provided by the grouping of behavioural areas and the provision of comparable socio-economic data. However, it failed to adequately cover all behavioural areas and to provide adequate coverage for the activities of particular sub-populations (Clark and Harvey, 1977). The classification did not adequately reflect generically different activities within a behavioural group nor did it adequately allow for differential meaning for any given activity across individuals or time, particularly where that meaning may be shaped by “a state of being” such as parents, adolescents, or the elderly. In particular, for example, parents and child care.

Capturing childcare has been time use researchers’ albatross for decades. It continues to elicit research to develop reasonable and useable measures of it (Goldschmidt-Clermont, 1990; Frederick, 1993; Fedick et al., 2005; Mullan and Craig, 2009). Mullan and Craig (2009) argue that the use of proximity and responsibility are interchangeable and can provide a viable means of generating child care measures as a basis for cross national comparison. Frederick (1993) in-

identified and examined four methods of collecting child care time use: as a primary activity in the time diary; parental social contact, captured by with whom; a special child care diary; and stylized questions. She found that child care time as a primary activity captured less than 25 percent of directly reported child care. The other three approaches, which all encompassed secondary child care time, provided similar estimates among themselves overall. However, analysis of the several measures yields differing results across sub-populations. There is clearly a need to enhance the contextual data in time use studies in a manner that permits the collection of valid and reliable caring data, not only for children, but for others as well.

Childcare measurement highlights another shortcoming of the conventional collection process, which goes to the heart of being able to move from micro to macro measurement of behaviour. Events performed by a paid worker or by a mother differ economically and socially, putting them in different groups, even though both are childcare. In the Multinational classification a childcare workers time, while working is simply paid work while a mother's care is recorded as childcare. Thus, a mother who is a child care worker by trade contributes more to child care time than is captured. Hence, following the Multinational approach, which is current practice, total societal time use for childcare can only be, if at all, crudely imputed. Similarly viewing TV could be leisure or work at any given time for a teacher. In reality, most activities listed in any coding scheme can be undertaken as paid work and yet the Multinational classification scheme, and all classification schemes to date, have reduced all job time to "paid work." In spite of the shortcomings, as indicated above, the Multinational coding scheme has played a major role in guiding subsequent schemes.

As previously mentioned, around the mid 1970s a recognised need to provide more disaggregated time use data for economic measurement was noted. In 1992 INSTRAW launched a programme leading to the publication of *Measurement and Valuation of the Unpaid Contribution: Accounting through Time and Output* (INSTRAW, 1995). About the same time the UN Statistical Office began to develop a time use classification that was based on two principals, consistency with the System of National Accounts (SNA) to provide satellite account aggregates and compatibility with existing time use classifications (Bediako and Vanek, 1999). The World Bank included time use in their guide to *Living Standards Measurement Studies* (Harvey and Taylor, 2000a). And, in the late 1990s, ILO undertook development of a time use diary classification to address the need for improved work time data (Hoffmann and Mata, 1999).

In 1994 EUROSTAT undertook a concerted effort to foster the collection of time use data in the EU and EFTA countries. The work led to development of guidelines for the Harmonized European Time Use studies (HETUS) for member countries. The HETUS activity coding scheme was based on the Multinational Study and modifications in Europe, Canada, and Australia. It was structured by the Ås categories on the basis of the activity imperative from necessary to contracted, committed and free time to reflect assumed activity priority. It maintained 10 behavioural groups, but combined household and child care into one group and created a travel group classification. Contributed data collected as a part of HETUS (2011) over the last decade is available for analysis online, as is ATUS data noted below.

In 2003 the Bureau of Labor Statistics (2011a) launched the American Time Use Survey (ATUS) a landmark study. It was the first full federal time use study in the US and the first study anywhere to gather time use data daily on a continuing basis. The (ATUS) coding system, an adaptation of the Australian 1997 system, is a hierarchical three-tiered system with 17 behavioural areas, each with two additional two-digit categories creating a six-digit classification system (Shelly, 2005). Because the study is continuous, it is a living changing system with the codes being updated prior to the commencement of interviewing each year and the changes are tracked (Bureau of Labor Statistics, 2011b).

### **3.5 Contextually derived behavioural units – Activities**

Time diary data are structured as a flow of events marked by a start time and end time, which define an event. The Multinational study, as noted above, collected primary activity, secondary activity, where, and with whom and a new event was considered to start when any one of the contextual elements changed. An activity classification is assigned either solely on the basis of a lexicon or in conjunction with other contextual variables. Such practices continue to this day. As greater demands were placed on the time use data for the measurement and study of non-market production and the division of labour, among other interests, various attempts to gathering “for whom” data have been implemented. Contextually defined activities were included in the Multinational Study classification scheme, for example “meals at workplace” and “medical care at home” used explicit location; “visiting friends” used explicit “with whom.” Additionally, “care to babies” implies “for whom” that must have been captured but not registered.

Multiple frames of reference persist in current classification schemes. For example, the EUROSTAT (1999) classification scheme allows two food consumption related codes as a part of the “Employment” behavioural group with multiple codes (i.e. 112 - Coffee and other short breaks, under 11 - Main job, and 112 - Coffee and other short breaks, under 12 - Second job). Such coding obfuscates what was really being done, in reality, by telling what was not being done “paid work”, which was not definitively specified in the first place. The activity may well have been “022 Snacks and drink”, “811 Reading periodicals”, “511 Socializing and conversation”, “724 Communication by computing (e-mail, chat)”, or any of a wide array of other codes. With the respondent being provided the code “112 Coffee and other short breaks” the more informative detail is lost. Coding and/or computer analysis can be used to capture the information that the activity occurred either at the workplace or between paid work activities thus showing breaks at work. A more rational approach to capturing and coding activity data would be provided by coding generic activities with relevant contextual data.

Overt action has little meaning out of context. Time, secondary activity, when, where, with whom, for whom, tension, enjoyment, technology, paid or not, are all contextual dimensions that have been explored (Harvey and Royal, 2000). Context may require, provide opportunity for, discourage, impede or prohibit an activity. The challenge in measuring time use is to identify relevant contextual dimensions and meaningful categories that will facilitate both collection and analysis.



Following the Multinational study, secondary activities, where, and with whom have been nearly universally captured in national studies. “For whom”, particularly required to understand caring and volunteering, has been infrequently and awkwardly captured. A notable exception is its use and development in the Australian Time Use studies. Each of these contexts should be regularly collected with each activity. Additionally subjective information, such as the level of enjoyment or tension level associated with the activity, greatly enriches the value of the information (Michelson, 1999; Krueger, 2009). Each of these dimensions contributes to the validity of the coding and analysis. For current purposes only the situational contexts, inherent in every activity, are examined here, beginning with “for whom” the activity is performed.

### **3.6 For whom – Purpose**

“For whom” or purpose provides the basic classification framework for the Multinational Study, Ås, and derivative classification systems. Behavioural group assignment to date has been deemed implicit in the activity itself (e.g. meal preparation, child care, shopping, eating) or assigned, oblivious to the actual activity (e.g. paid work, second job). A teacher shopping could be buying groceries for her/his household, a church supper, or buying materials to use for her/his class. In each case the shopping would be the same behavioural unit and should fit into a different behavioural group, but which one? One needs to know “for whom” or the purpose of the shopping to code it correctly. Once coded into a behaviour group, without appropriate context, its purpose is fixed. Although knowledge of whether an activity is performed for work, family, oneself, or others is crucial for correctly classifying behavioural units and assigning each of them to behavioural groups, it has rarely been collected.

“For whom” was first explicitly asked in the 1991/92 German Time Use Survey. Respondents were asked to indicate whether the activity was done for: one’s own household, for another household, or social services/voluntary and community work (Ehling, 1999). It has been most intensively used in the 1997 and 2006 Australian time use studies with increasing refinement. In 1997 the “for whom” categories were aligned with their survey of volunteer work making it possible to assign volunteer work to the appropriate organization (Australian Bureau of Statistics, 2002, 2008). In 2006, activities that were done for family members within the household were also coded to reflect the health status of household members (sick, frail, with a disability, well).

In 1998 the EUROSTAT diary, containing a “for whom” option was piloted in several countries. The pilot found that quality diaries revealed helping in all major groups (Rydenstam and Wadeskog, 1998). Unfortunately use of the “for whom” code was found problematic in some countries and was not adopted in the final EUROSTAT recommendations for the time diary.

France was one of the countries using the “for whom” column in 1998 (Roy, 2011). The exact wording of the column was “votre activité est dans un but”... (i.e. the goal of your activity is...) and the choices were: personal (for yourself or your own household), professional, help to another household, or volunteer work within an organization. It was asked of all episodes. When preparing for the 2010 time use survey, consideration was given to removing it in order to make

room in a visually overcrowded diary, since in 1998 it was infrequently used and somewhat confusing to households. The problem was subsequently identified. The decision was made to keep it in 2010 in response to requests from volunteer workers, but most importantly since it was used in the previous activity coding process and they wanted the coding process and activity list to be comparable with that of 1998. Interestingly, in the 2010 time use survey, they over-sampled teachers in response to a Ministry of Education request. The Ministry wanted to measure the “real” work time of teachers, something they have previously been unable to do (Roy, 2011).

The nation-wide Venezuelan time use survey, in progress through 2011, illustrates a frequently used approach to capture non-market production in time use surveys (Blanco, 2011). It contains a question asking, when there was no market exchange, “who benefitted”. This was asked for: food preparation, household cleaning, care of persons, repair of cars and other devices, and washing and repairs of clothing when they appeared in the diary. All “for whom” questions provide the same set of options: each one of the household members registered through a questionnaire applied before the diary: family members that are not part of the household; domestic workers; members of other households; a disaggregated set of 8 community, religious, and cultural non-profit organizations; and others.

“For whom” coupled with an appropriate classification for work tasks would enable time use researchers to finally open the black box of paid work as proposed by the ILO (Hoffman and Mata, 1999). Between one-third and one-quarter of all working activities performed by adults for pay or profit are duplicates of activities carried out in everyday life (e.g. cooking, cleaning, researching, learning, caring, meetings to name a few). Therefore, the distinction between employment and other activities is based on the purpose or “for whom” the activity was undertaken (Hoffman and Mata, 1999).

The set of codes used to describe the different possibilities of “for whom” has varied considerably across studies (Harvey and Royal, 2000). International agreement is needed on a basic structure that is flexible enough to permit expansion or contraction as warranted or needed. Two “for whom” classifications provide an analytical example in this paper (see Table 1). The first was developed by the Saint Mary’s University Time Use Research Program for the Nova Scotia Teachers Union (NSTU) in order to focus explicitly on various work activities of teachers. The other was developed at the International Labour Organisation (ILO) collapsing work options in favour of an expanded non-work classification. Both allow for closure (the ability to sum the day to 24 hours) by offering categories for all activities.

**Table 1**  
**Nova Scotia teachers study (1999) “For whom” classifications**

<b>NSTU</b>	<b>ILO</b>
0 Self	10 For work, pay, profit
1 Single student (not individual program plan)	21 Oneself
2 IPP student(s)	22 Own children
3 Multiple students	23 Others in household
4 Administrator	24 Relatives not in household
5 Family	25 Pets
6 Community	30 Other/mixed family/self
7 Teachers’ union	31 Other children not of household
8 Other person(s)	32 Other adults not of household
	33 School
	34 Church
	35 Community
	36 Organisation
	40 Other Purposes

Source: Nova Scotia teachers study, Canadian General Social Survey 1999.

### 3.7 With whom – Social contact

Social contact, measured by “with whom”, is significant on several fronts including child care measurement (Frederick, 1993) and travel demand analysis (Harvey and Taylor, 2000b; Spinney et al., 2009). Time alone, with family, or with friends is an important dimension of understanding the contextual setting of a distinct behavioural unit. The same activity undertaken alone, at the workplace, with the family, or with friends is inherently different. As a result, the “with whom” contextual codes are used to determine various dimensions of social contact. For example, “with whom” was used to identify a social companion in a study of the benefits of public holidays (Merz and Osberg 2009). In another study, Merz and Rathjen (2009) used it to account for social participation in defining genuine personal leisure time in an analysis of time and income multidimensional poverty.

Socializing is a difficult concept to illustrate and measure (McLennan, 1997). In order to measure the impact of social interaction on society and the behaviour of the individual, it is necessary to incorporate all the dimensions of the social environment (Schneider, 1972). Australia approached the measurement of socializing in different ways between their 1992 and 1997 national time use surveys (McLennan, 1997). In 1992, visiting someone for a social purpose was coded as socializing, independent of the activities undertaken. The activities undertaken during socializing were recorded in the 1997 survey providing increased detail on the activities people engage in while socializing. Output analysis of the 1992 and 1997 time use surveys indicates that the amount of time spent on socializing had decreased from 77 minutes to 11 minutes, while time spent on eating and drinking increased from 64 to 93 minutes and talking increased

from 16 to 35 minutes. If the average amount of time spent eating, drinking, and talking with people other than members of the household is taken into account, the 1997 estimate for socializing is broadly comparable with the 1992 results (McLennan, 1997). This suggests the data loss that can be experienced through the use of omnibus activity codes, as both quality and quantities were affected.

### **3.8 Location**

Location information can take two forms – generic and spatial. Typically time use studies collect generic location information such as home, workplace, someone else’s home, etc. Spatial coordinates, on the other hand, have rarely been collected. However, the availability of GPS technology, which facilitates the capture of spatial coordinates and has the potential to improve the accuracy and precision of time diary data, has generated experimentation with spatially coded time use studies (for examples see Murakami and Wagner, 1999; Jones and Stopher, 2003; Stopher et al., 2007; Spinney and Millward, 2011a).

The location of activities has important implications for the analysis of paid work, even though there are many different definitions of what constitutes work activities (Drago et al., 1999; Mata-Greenwood, 1992). The traditional measure of time spent in employed labour has been hours of work derived from establishment or labour surveys. However, both of these provide macro measures that fail to capture the reality of paid work time as it is realized. All time spent at the work place is not paid work and all paid work time is not done at the work place. Drago et al. (1999) used the location contextual codes to examine the amount of work done at home, especially when household members are present, as a measure of “work invasiveness” defined as the degree to which a dominantly workplace occupation invades family time at the home. Harvey and Spinney (2000a) discovered that Nova Scotia teachers had homework averaging 1 to 2 hours per night, and on the weekend, totalling about 10 hours a week.

Time use and location information also contributes significantly to travel behaviour analysis and modelling (Janelle and Goodchild, 1983; Timmermans et al., 2003; Harvey, 2003). That is, location information, for both the origin and destination of travel activities, is required for traditional four-stage transportation planning models and has been used to examine a wide variety of travel behaviour. For example, Millward and Spinney (2010) have examined differences in time use, travel purpose, and travel mode by residential location along the urban-rural continuum, while Spinney and Millward (2011b) used detailed location information to examine travel mode choices for children’s journey to school.

The statuses of “for whom”, social interaction, and location, which provide situational context for all activities, are needed to assign behavioural units to different, yet related, behavioural groups. The next section describes an example of the use of “for whom” to define contextually derived behavioural groups, while the subsequent sections illustrate the implications of not using “for whom” in the study of paid work.

## **4 Data and methods**

The ILO and NSTU coding schemes (Appendix A and B, respectively) were implemented during late 1999 with teachers throughout Nova Scotia, Canada. Although the activity codes or behavioural units are deemed the most important aspect of time diary data, the context codes can be equally important. The survey and diary were self-completed by a random selection of teachers throughout Nova Scotia using a diary design that was based on the Dutch SCP studies (van de Broek, 1999).

The study of Nova Scotia teachers created an opportunity to implement the collection of “for whom” for all activities as a column in the teacher’s diary. An objective of the teacher’s study was to examine the workload implications of the preparation and implementation of Individual Program Plans (IPPs) for special needs students. “For whom” information was needed to allocate various teachers activities between IPP and non-IPP students. As experimentation, and to provide closure, it was decided that options would be provided to encompass all diary activities. A pilot study indicated that it was a viable addition and it was used in the study. During progress of the NSTU study researchers at the ILO, who were interested in new approaches to measuring labour time, asked us to administer a similar instrument that utilised alternate activity and contextual codes (Appendix B) to a sample drawn from the NSTU study population. Completion of the two studies provided the opportunity for comparison of the same population of teachers with two coding schemes, which differed in terms of their behavioural and contextual units.

The NSTU instrument was designed to capture work activities using a 16 category classification with five work-related “for whom” codes and four non-work “for whom” options (Appendix A). The ILO instrument provided an eight category work classification with 14 “for whom” codes including only one work code and 13 non-work options (Appendix B). The ILO activity classification was developed as a compromise between a “what” classification (not pre-defined into behavioural groups) and a classification scheme that can be used by respondents to define their own activities. This means that, given the appropriate context, teachers could potentially use any activity code to describe their work activities.

## **5 Results**

Although the teachers in the NSTU and the ILO studies used a discrete list of “teaching activities” to code their work-related activities, many teachers also identified activities in other behavioural groups as work-related. The NSTU classification scheme was created as a “type of activity” classification that is essentially independent of the context in which activities are being carried out. Contextual work attribution was not made directly to “work” as was the case in the ILO scheme, which explicitly offered “work” as an option. Rather respondents were presented with a defined list of work-related parties “for whom” they may be undertaking the tasks

reported. However, when all activities that were reportedly performed for students, administrators, or the teacher’s union were identified, more than two-thirds of respondents in the NSTU sample had recognized the independence of the contextual codes and assigned forty-two additional behavioural units to the behavioural group “employment”. Similarly, the ILO data were filtered to include all events that were performed “for work” (code 10). The myriad of different activities that respondents used to describe their work expanded from the eight activity codes listed under “teaching activities” to thirty-five different behavioural units. Two-thirds of all respondents made “contextually derived” assignments to work. The frequencies of the ten most frequently occurring contextually derived (CD) activity codes in the NSTU and ILO samples are illustrated in Table 2.

**Table 2**  
**Ten most frequent contextually derived activity codes**

NSTU			ILO		
Activity Code	Description of Activity	Percent of all CD Codes	Activity Code	Description of Activity	Percent of all CD Codes
600	Attending meetings	13.5	55	Attending meetings	36.9
800	Coaching	11.8	52	Clerical activities	19.1
92	Travel by car as driver	11.5	21	Driving car	13.4
530	Homework: coursework	5.8	51	Management activities	8.3
100	Meal preparation	5.2	13	Interior decorating	5.1
910	Watching television	5.2	81	Eating/ personal hygiene	4.5
620	Volunteer work	4.5	74	Telephone/Internet	3.8
580	Other study	4.1	41	Buying food/supplies	2.5
500	Full - time classes	4.0	73	Talking/socializing	1.9
550	Breaks / waiting	3.3	54	Organising meetings	1.3
	Total	68.9		Total	96.8

See Appendices A and B for respective coding schemes.

Source: Nova Scotia teachers study, Canadian General Social Survey 1999, own calculations.

The ILO data indicate that the top five primary activity codes make up over 82%, while the top ten primary activity codes represent 97% of all non-work activity codes respondents relied upon to describe their teaching activities. The NSTU data indicate the top 10 primary activity codes represent 69%, while the top 14 make up 79 % of all contextually derived teaching activities. Not as many respondents (34.3%) from the NSTU study compared to those from the ILO study (37.8%) used contextually derived activity codes to describe their work, possibly due to the more exhaustive “employed work” categories within the NSTU activity-coding scheme.

When the NSTU data were filtered to include all activities that were reportedly performed for students, administrators, or the Teacher’s Union (codes 1, 2, 3, 4, or 7 in the “for whom” category), the number of activity codes that respondents used to describe their work expanded from 16 to a total of 61. The three most frequently occurring contextually derived codes were attend-

ing meetings (13.5%), coaching (11.8%), and travel (11.2%). Contextually derived teaching activities represent 2.3 additional hours per respondent per week. This compares to an average of 7.4 additional work-hours per respondent per week from contextually derived teaching activities performed by 37.8% respondents in the ILO database.

Contextual coding provides a basis for redirecting the assignment of an event during coding, as some examples from the teacher's work time study illustrate. For example, "for whom" in both the ILO and NSTU versions of the teachers study indicated some instances of work-related shopping activities. Under normal coding procedures such shopping would invariably be classified as "domestic" instead of "work". That would introduce two errors into the data, "domestic work" time would be overstated and "paid work" time would be understated. Only if the task (e.g. shopping) and purpose (e.g. work) are distinguishable in the event can proper assignment be made. As another example, course attendance and homework are typically grouped in "professional development." However, it may actually be "paid work" for teachers during a professional development day.

While the above examples have focused on "paid work", the data indicate that each behavioural group is affected by improper assignment by missing or gaining events due to lack of "for whom" (purpose) information. In fact, organization/volunteer, professional development, domestic, sports, and travel activities, about half the behaviour groups, are represented in the top two-thirds of contextually derived work-related activities in the NSTU sample (Table 2). Similarly, the ILO data indicate six behaviour groups are affected by contextually derived work-related activities, with nearly two-thirds of the CD codes falling under "management". A considerable number of activities were assigned to work in lieu of their traditional assignment. Respondents assigned 63% of all coaching activities, normally assigned to sports, as work-related (Table 3). Over 40% of recorded "other study", "full time classes", "travel by other means", and "meetings" were assigned to "paid work". Other such assignments can be noted in Table 3.

The implications of using "for whom" information are further illustrated in Table 4, depicting the mean daily time allocation for each of the 10 behavioural groups in the NSTU coding scheme. Column A illustrates the amount of time spent in each behavioural group as reported by the activity code, column B indicates the amount of time engaged in those activities if they are reported as being "for work" (i.e. "for whom" equals 1, 2, 3, 4, or 7), while column C lists the daily time budgets for the same activities that were reportedly performed for non-work purposes (i.e. "for whom" equals 0, 5, 6, or 8). The final column reports the ratio of contextually-derived work activities (Column B) as a proportion of the total time spent engaged in that behavioural group (Column A). Contextually derived codes added an average of 19.2 minutes per day from behavioural groups other than work, 2.3 hours a week, to the teachers' workload (Table 4). This is primarily accounted for by "personal development", "meetings", "travel", "sports/hobbies", and "media". In the absence of the contextual coding that time, approximately 10% of the day would have been assigned to the incorrect behavioural groups from the respondents' perspective.

**Table 3**  
**Non-work codes attributed to work by coding approach , NSTU study**

	Activity coded		For whom coded		Total	
	Number	%	Number	%	Number	%
Coaching	217	62.8	128	37.2	345	100.0
Other study	86	44.6	107	55.4	193	100.0
Full-time classes	76	42.8	102	57.2	178	100.0
Travel by other means	24	41.1	35	58.9	59	100.0
Meetings (union, family, other)	257	40.7	374	59.3	630	100.0
Breaks/waiting for class	60	37.9	99	62.1	159	100.0
Special lectures: occasional	62	31.2	138	68.8	200	100.0
Work for pay at other jobs	64	28.1	165	71.9	229	100.0
Volunteer work	84	24.8	255	75.2	339	100.0
Other classes (part-time)	41	21.7	146	78.3	186	100.0
Waiting before or after work	55	20.7	211	79.3	266	100.0
Leisure & special interest classes	12	20.7	45	79.3	57	100.0
Homework: Career or self	124	19.8	503	80.2	627	100.0

\* Data are weighted by “day weight”.

Source: Nova Scotia teachers study, Canadian General Social Survey 1999, own calculations.

**Table 4**  
**Time use (mean daily minutes) by work reporting approach, NSTU study**

Activity Group	A	B	C	D
	Activity only	For work	Not for work	Ratio B/A [%]
Teaching	364.3	300.1	64.3	82.36
Domestic	125.9	1.7	124.3	1.33
Caregiving	36.7	0.7	36.1	1.78
Shopping	25.1	0.5	24.6	1.91
Personal	612.0	0.0	612.0	0.00
Development	17.0	4.5	12.6	26.27
Meetings	18.6	3.4	15.2	18.39
Entertainment	43.6	0.6	43.0	1.40
Hobbies	29.0	2.5	26.5	8.47
Media	92.2	2.1	90.1	2.28
Travel	75.5	3.4	72.2	4.47
Total	1440.0	319.3	1120.7	

\* Data are weighted by “day weight”.

Source: Nova Scotia teachers study, Canadian General Social Survey 1999, own calculations.

At the same time, 64.3 minutes, of “paid work”, as identified by work activity, was not so assigned contextually. The point is not necessarily the actual numbers themselves, but the gestalt of misallocated time through current approaches to collecting and coding data.



In virtually all cases, if appropriate contextual data is collected and the activity is not compromised by specific assignment to a predetermined group, in a predefined behavioural grouping scheme, it can be properly assigned to any appropriate behavioural group for reporting or analysis through data manipulation.

## **6 Summary**

Although time diaries date back to the early part of the last century, a solid basis on which to identify and classify activities continues to escape time use researchers. The approach of having respondents self-complete their diaries with a set of activity and contextual codes developed a priori requires a rethinking of our approach to coding of time diaries. It is argued here that the proper approach to coding first requires that the “behavioural units” (activities) be established. Once this is done, subsequent manipulation can be carried out to aggregate the identified activities into a plethora of “behavioural groups” (i.e. trading, production, personal care, paid work), each defined by a set of appropriate contextual variables.

The basic premise is that activity codes are essentially independent of their contextual setting. For example, cooking is the activity or behavioural unit and it may be assigned to employed work (if done for pay or profit), household production (if done for self or family at home), leisure/ socialising (if done for pleasure with friends), or professional development (if done as part of a school assignment). The purpose for performing the activity, social contact, and location are the three main contextual codes used to assign behavioural units to appropriate behavioural groups.

The purpose of a behavioural unit is the primary mechanism by which behavioural groups are defined, and its importance should not be underestimated. Whether the activity is performed for work, family, or oneself, determining the purpose of an activity allows researchers to classify that same activity into several different behavioural groups, depending on the objective of the research. The purpose of an activity, independent of the activity itself, also allows researchers to open the black box of paid work. For example, approximately one-third to one-quarter of all working activities performed by adults is for pay or profit. The use of contextual variables permits analysis of the types of activities that are carried out at work, such as cooking, cleaning, researching, caring, and meetings to name a few. The distinction between employment and other activities is based entirely on the purpose or “for whom” the activity was undertaken (Hoffman and Mata, 1999), and not only what it is that is being done.

Since a significant portion of activities occur as secondary activities, such as childcare and media, the purpose of secondary activities needs to be collected as well. Otherwise, there is no precise means of determining whether the secondary activity was performed for the same purpose as the primary activity. However, the other context variables, such as social contact and location are normally fixed for each event and are essentially independent of the activity performed and thus need not be collected separately for the secondary activity.

Social contact or social interaction is a difficult concept to illustrate and measure (McLennan, 1997). The same activity undertaken at the workplace and with the family is inherently different in terms of their social contact. As a result, the “with whom” contextual codes are used to determine various dimensions of social contact. Time alone, with family, or with friends is an important dimension of understanding the contextual setting of a distinct behavioural unit.

The use of locational attributes in concordance with different travel activity permits detailed analysis and modelling of regional travel behaviour. The location of activities also has important implications for the analysis of paid work, even though there are many different definitions of what constitutes work activities. For example, Drago et al. (1999) used the location contextual codes to examine the amount of work done at home, as a measure of “work invasiveness,” the degree to which a workplace occupation invades family time at the home.

Two coding schemes, one from the ILO Trial Classification and another used by the NSTU study were used to illustrate the use of contextually derived activity codes and behavioural groups for analysis of time diary data. The primary focus was the varying degrees to which the different coding schemes inherently rely upon contextually derived or defined behavioural groups. The ILO and NSTU coding schemes appear to be, to different degrees, a compromise between a “type of activity” classification that is completely independent of the context in which activities are being carried out and a classification scheme that could be easily used by respondents to code their own activities. Essentially, teachers could potentially use any activity code to describe their work activities.

When the NSTU data were filtered to include all activities that were reportedly performed for students or administrators (codes 1, 2, 3, 4, or 7 in the “for whom” category),

- the number of activity codes that respondents used to describe their work expanded from 16 to a total of 61,
- 34% of respondents used contextually derived activity codes,
- the top 10 contextually derived primary activity codes represent 69% of all the contextually derived teaching activities,
- the three most frequently occurring contextually derived codes were meetings (13.5%), coaching (11.8%), and travel (11.5%), and
- contextually derived teaching activities represent 2.3 additional hours per respondent per week.

When the ILO data were filtered to include all activities that were performed for work (code 10 in the “for whom” category),

- the number of activity codes that respondents used to describe their work expanded from 8 to a total of 22,
- 38% of all respondents used these contextually derived activity codes,
- the top 10 contextually derived primary activity codes represent 97% of all the contextually derived teaching activities,

- the three most frequently occurring contextually derived codes were meetings (36.9%), clerical activities (19.1%), and travel (13.4%), and
- contextually derived teaching activities represent 7.4 additional hours per respondent per week.

The net result of the foregoing analysis is that under current coding practice there are behavioural units that are being improperly coded to behavioural groups through a priory assignment.

## **7 Conclusions**

A need exists to capture both the activities in which individuals engage and the context in which they occur. It is necessary to know, at least, what activities are performed, “for whom” they are done, who was present and where the activities took place if we are to fully understand and accurately describe the use of time. The purpose of an activity, independent of the activity itself, should be the primary mechanism by which behavioural units are aggregated into different behavioural groups. The data structure has to be such that any event is definable to any meaningful descriptive or analytical purpose. The capture and use of social contact continues to challenge time use researchers. However, time-diary data that include “with whom” information permits analysis of social contact and thus needs to be an integral part of any classification of behavioural units into respective groups. The locational context codes are another important means of defining contextually derived behavioural groups, and are often underutilised insofar as their potential to permit linkage of spatial and temporal dimensions to time diary data.

The Australian study appears to offer an ideal testing ground for examining points raised here, from data collection through analysis. Their response rates are excellent given the complexity of their diary. The broad range of contextual variables offers ample opportunity to pursue a variety of behavioural grouping options. With existing database and querying technology, retrieval of alternate groupings for analysis presents only minor challenges. A more significant challenge would be to develop a system that could go from the natural language verbatim information recorded in the diaries, through the coding, grouping, and reporting.

The coding schemes that are used to represent different activities and their contextual settings have moved from the general to the specific. This movement towards the specific is inherently misguided. This report argues that a list of discrete activities, ideally including paid work detail, should be identified first. Then appropriate contextual variables can be identified, and used, as needed, to assign activities to different behavioural groups. The improved use of contextual codes, particularly “with whom” will increase the variety of activities, provide more analytical detail, reduce multiple frames of reference, facilitate comparability among coding schemes and allow researchers to derive significantly more information from the activity data, while relying on more general activity codes.

## Appendix

**Table A1**  
**ILO coding scheme**

<b>Context codes</b>			
For whom	With whom	Where	Tension level
10 For work, pay, profit	1 Alone	1 Workplace	0 Very relaxed
21 Oneself	2 Own children	2 Own dwelling & surroundings	1 Relaxed
22 Own children	3 Other household members	3 Shops, banks, other public places	2 Somewhat relaxed
23 Others in household	4 Pets	4 Other premises	3 Neither relaxed nor tense
24 Relatives not in household	5 Non-household relatives	5 Outdoors (parks, street, etc.)	4 Somewhat tense
25 Pets	6 Colleagues		5 Tense
30 Other/ mixed family/self	7 Friends		6 Very tense
31 Other children not of household	8 Non-household children		
32 Other adults not of household	9 Non-household adults		
33 School			
34 Church			
35 Community			
36 Organisation			
40 Other Purposes			
<b>Activity codes</b>			
<b>Teaching activities</b>		42 Buying household appliances, articles, equipment	
01 Class instruction		43 Buying other capital goods	
02 Preparations for class instructions etc.		44 Using banking and other financial services	
03 Supervision of class or other groups of students		45 Selling goods or services	
04 Marking, grading, filling report cards		46 Keeping accounts, paying bills	
05 Preparation of IPPs and IMPs		47 Other trading/ shopping	
06 Consultations, tutoring of individual students		<b>Management, administration, meetings (except teaching)</b>	
07 Student discipline		51 Management activities: discussing, negotiating, representing, organising, supervising or inspecting others (except students)	
08 Other teaching-related		52 Clerical activities: storing, filing, sorting, classifying, calculating, typing	

**Table A1 cont.**  
**ILO coding scheme**

<b>Activity codes</b>	
<b>Production activities and similar</b>	53 Collecting materials, delivering goods
11 Gardening, digging, planting, harvesting, picking, etc.	54 Organising meetings
12 Tending animals	55 Attending meetings
13 Interior decorating, maintaining/ repairing of buildings	56 Other management
14 Making handicrafts, pottery, wood-working	<b>Caring activities</b>
15 Weaving, knitting, sewing and similar	61 Teaching, guiding, coaching, leading (other than students)
16 Food preserving: butchering, baking, curing	62 Giving medical care
17 Cooking, serving drinks	63 Washing, dressing, feeding, helping
18 Setting tables, serving food and drinks	64 Protecting
19 Other production activities	65 Accompanying
<b>Driving and being transported</b>	66 Other caring activities
21 Driving car or other vehicles	<b>Creative activities &amp; entertainment</b>
22 Driving motorcycle	71 Thinking, researching, analysing, programming, synthesising, designing
23 Bicycling	72 Reading, writing (except as preparation for class instruction = 02)
24 Driving motor-boat, sailing	73 Talking face-to-face , socializing., hosting
25 Being transported in private car, boat or similar	74 Telephoning, Internet-chatting and similar
26 Being transported in public bus, train, boat, airplane, or similar	75 Drawing, painting, creating and performing music, acting, photographing, collecting objects, dancing
27 Other transport	76 Visiting and attending public places and events (museums, sports, religious, concerts, )
<b>Cleaning, sweeping, ordering</b>	77 Watching television
31 Cleaning dwelling, sweeping hall, stairs, yard	78 Physical exercise, playing and walking
32 Cleaning/washing dishes	79 Other creative activities
33 Cleaning/washing clothes/textiles, ironing, etc.	<b>Personal care &amp; maintenance, passive periods</b>
34 Ordering papers, books and similar	81 Eating, drinking and personal hygiene
35 Ordering dwelling, rooms	82 Learning, studying
36 Sorting and disposing of garbage and similar	83 Receiving care
37 Other cleaning	84 Sleeping, relaxing, sitting, doing nothing, and affective activities
<b>Trading/ shopping activities</b>	85 Waiting
41 Buying food and household supplies	86 Other personal care

Source: International Labour Organization

**Table A2**  
**NSTU coding scheme**

<b>Context codes</b>			
<b>For whom</b>	<b>With whom</b>	<b>Where</b>	<b>Tension Level</b>
0 Self	0 Alone	0 Home	0 Very relaxed
1 Single student (not IPP)	1 Single student (not IPP)	1 Classroom	1 Relaxed
2 IPP Student(s)	2 IPP student(s)	2 Staff room	2 Somewhat relaxed
3 Multiple students	3 Multiple students	3 Office	3 Neither relaxed nor tense
4 Administrator	4 Administrator	4 Gymnasium	4 Somewhat tense
5 Family	5 Classroom teacher(s)	5 Outside (school yard)	5 Tense
6 Community	6 Specialist teacher(s)	6 Other (in school)	6 Very tense
7 Teachers' Union	7 Spouse/ Partner	7 In transit	
8 Other person(s)	8 Child(ren) of the household	8 Other place	
	9 Other person(s)		
<b>Activity codes</b>			
<b>Employed work</b>		<b>Professional development</b>	
001 Class instruction/ tutoring		500 Full-time classes	
002 Administration		511 Other classes (part-time)	
003 Preparation		512 Credit courses on television	
004 Supervision		520 Special lectures: occasional	
005 Extra-curricular		530 Homework: course, career/self-development	
006 Meetings		550 Breaks/waiting for class	
007 Student discipline		560 Leisure and special interest classes	
008 Marking, grading		580 Other study	
009 Paperwork, report cards		<b>Organizational, voluntary and general meetings</b>	
010 Telephone (work-related)		600 Meetings: professional, union, political, civic activity, support groups, fraternal and social organisations	
011 Committee work		610 Meetings: religious, religious services, prayer/bible readings	
012 IPP's		620 Volunteer work (organisations) and unpaid help for others	
013 Travel during work		630 Other organisational, volunteer, or religious activity	
014 Waiting/ delays/ idle time at work		<b>Entertainment (attending)</b>	
015 Work for pay at other jobs		700 Sports, concerts, fairs, parades, zoos	
016 Other teaching-related		720 Movies, films, museums, art galleries, ballet, theatre	

**Table A2 cont.**  
**NSTU coding scheme**

<b>Activity codes</b>	
<b>Domestic/household work</b>	730 Socializing. with friends/relatives
100 Meal preparation (baking, cooking, cleanup)	740 Socializing. at bars, clubs (no meal)
120 Indoor cleaning/ outdoor cleaning	750 Casino, bingo, arcade
130 Laundry, ironing, folding, clothing care	760 Other social gatherings
140 Maintenance and repair (interior, exterior, vehicle, other)	<b>Sports and hobbies (participating)</b>
150 Gardening and pet care	800 Coaching
160 Other household tasks	810 Sports participation, exercising
<b>Care giving for household members</b>	820 Hunting, fishing, camping, other outdoor activities/excursions
200 Child care (getting ready for bed, school, personal care)	830 Hobbies, home crafts, music, theatre, dance
220 Helping, teaching, reading, talking, play with children	860 Games, video games, leisure computer use
230 Care of household adults (personal, medical, help & other)	870 Pleasure drives, sightseeing, other sport or active leisure
<b>Shopping and services</b>	<b>Media and communication</b>
300 Groceries and other regular shopping	900 Listening to the radio
310 Shopping for durable goods	910 Watching television
320 Services (government, financial, medical, dental, lawyer)	920 Listening to CD's, cassette tapes, or records
330 Automobile maintenance and repair services	930 Reading books, magazines, pamphlets, bulletins, newsletters
370 Waiting for purchases or services	940 Reading newspapers
380 Other shopping and services	950 Talking, conversation, telephone
<b>Personal care</b>	960 Mail (reading/ writing), other media and communication
400 Washing, dressing	<b>Travel</b>
410 Personal medical care (at home)	091 Travel (walking)
420 Private Prayer, Meditation and Other Informal Spiritual Activities	092 Travel by car as driver
430 Meals /snacks/coffee	093 Travel by car as passenger
440 Restaurant meals	094 Travel by bicycle
450 Sleep/ naps	095 Travel by public transit
470 Relaxing, thinking, resting, smoking	096 Travel by other means
480 Other personal care or private activities	

Source: Nova Scotia Teachers Union

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