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WHEN TWENTY-FOUR HOURS IS NOT ENOUGH: TIME POVERTY OF WORKING PARENTS

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ABSTRACT. Individuals can be money poor, time poor or both. While income is the most used indicator of poverty, broader indexes including non-monetary aspects of deprivation have been proposed and measured. As one such measure, our study focuses on the element of deprivation arising from the time deficit of many working people. The usual poverty threshold is calculated as the amount of income to buy the minimum required goods and services from the market. This minimum required purchase is greater for these people since they have less time than the average person to produce some goods and services for themselves at home. So, they need money to buy these in the market in order to maintain the same consumption. The income standard must be supplemented to adequately measure actual poverty.Time use data make it possible to establish time requirements and time availability and provide a measure of time poverty. Using Canadian GSS 1998 data, and building on the work of Vickery (1977, 'The time poor: A new look at poverty', The Journal of Human Resources 12(1), pp. 27-48) and of Douthitt (1993, 'The inclusion of time availability in Canadian poverty measures', Time-Use Methodology: Toward Consensus (ISTAT, Roma), pp. 83–91), and our own previous study, we estimate time-adjusted poverty thresholds and rates for single and dual parent Canadian families. As expected, we have found high incidence of time deficit among the employed single parents with children. We make a case for the acceptance of a redefined poverty standard for such time-deprived groups.

KEY WORDS: lone parent, poverty, time-deficit, time-use

Poverty, in the sense of economic deprivation, can be theoretically analyzed in the framework of welfare analysis involving utility functions. As a practical measure, income is the most used indicator of poverty, since money buys most things one needs. Money, however, does not buy everything, thus, broader indexes including non-monetary aspects of deprivation have been proposed and measured.[1] In the context of these poverty measures, this paper addresses the element of deprivation arising from the time deficit of many working people. In particular, our target of study is a severely time deprived group, namely, working parents, especially single parents, living with one or more children under 15 years of age, and having no other adult member in the household. It is possible to deal with the issue of time poverty

at two different levels: first, as an element to be integrated with the income measure of poverty, and second, in the broader context of the various effects of time deprivation. In this paper, we focus on the first issue, that is, the need to redefine the money poverty threshold to account for the money value of time deficit.

The usual poverty threshold is calculated as the amount of income, needed by a family of a certain structure, to buy the minimum required goods and services from the market. What is not accounted for in these estimates is the additional burden of time-poverty borne by those who have to work long hours at low wage rates to earn a living. The minimum required purchase is greater for these people since they have less time than the average person to produce some goods and services for themselves at home. It is well known from many studies, including our own estimates, that un-marketed household production (meal preparation, child care, housekeeping, etc.), if evaluated at market prices, would increase the measured Canadian GDP by more than 45% (Harvey and Mukhopadhyay, 1996). This is the output of one's own unpaid labor at home. Those who lack the time to produce these goods and services for themselves need money to buy them in the market in order to maintain the same consumption. The income standard must be supplemented to adequately measure actual poverty. Time use data make it possible to establish time requirements and time availability and provide a measure of time poverty. Currently, an increasing number of countries are undertaking time-use studies, with an increasing number of studies carried out since 1995. This study, building on work of Vickery (1977) and Douthitt (1993), estimates time-adjusted poverty thresholds and rates for Canadian families.

1. INCOME POVERTY MEASURES

Statistics Canada publishes two relative measures of low income, the Low Income Cutoff (LICO) and the Low Income Measure (LIM), with a disclaimer that neither of these two measures should be interpreted as their definitions of a poverty line (Statistics Canada 1999; 2001). In addition, a consultation process has been launched to develop a need-based Market Basket Measure (MBM) of income poverty. In the USA, a need-based poverty threshold concept has been in use since the 1960s for the purpose of measuring the incidence of poverty.

A Low Income Cutoff (LICO) is an income threshold below which a family is likely to spend significantly more on food, shelter and clothing than the average family. A low-income family is identified by this criterion of

spending pattern since lower income families spend a greater fraction of their incomes on these basic items of consumption. As an example, consider the calculation of LICO in terms of after-tax income for a family of four living in an urban area of 30–100 thousand people. The average percentage of after-tax income spent on food, shelter and clothing by all households (regardless of size) in Canada in 1992 was 44%. The LICO is then determined from the income level below which households spend at least 64% (that is, 20% more than average) on these items. This amount was C$23,546 in 1999, with 1992 as the base year for calculating the spending pattern. While the current base year is 1992, it has been updated several times in the past, since the average proportion of income allocated to food, shelter and clothing has been changing (falling) over time as the average family income is increasing.

The LIM published by Statistics Canada is defined as 50% of median income, where the income is calculated with an adjustment using an equivalence scale to adjust for family size and composition. This equivalence scale, which allows for economy of scale in spending requirements by family size, uses a weight of 1 for the first family member and 0.4 for the second family member, regardless of age. The third and subsequent family members are assigned a weight of 0.4 or 0.3 depending upon whether or not they are aged 16 or over. In this study, we have used LIM, not LICO, as the income poverty measure for Canada.

Perhaps the most acceptable concept of the income poverty threshold is the MBM, which estimates the cost of buying a basket of necessary goods and services. In comparison with LICO and LIM, which are relative measures of poverty, MBM is often called an absolute measure because it does not depend upon the income distribution and the spending pattern of the country as a whole.[2] Statistics Canada has launched plans to collect the necessary data to produce the MBM. In the USA, the current measure of official poverty thresholds was developed in the early 1960s and is based on the cost of a minimum diet times a "multiplier" (or factor) of three to allow for other essential expenses such as housing and clothing (Citro and Michael, 1995:24). This cost of food is determined from an "economy food plan" involving only home-prepared meals produced with careful management of food storage and food preparation. The multiplier of three was derived from a 1955 survey showing that the average family of three or more persons spent about one-third of after-tax income on food. *The poverty thresholds derived on this basis, therefore, assume that a significant amount of time is devoted to "household production" of goods and services*. Not only the food preparation, but also other household work such as maintenance,

childcare, etc., is required to be done with a minimum amount of market input. Families who are working to earn wage income at the poverty threshold level need additionally to devote a substantial amount of time in non-market (household) production activity in order to maintain the consumption standard intended by the threshold concept. The central issue in deriving the time-adjusted poverty threshold is that some low-income families may not be able to devote this additional required time for household production activities.

The National Research Council (NRC) study (Citro and Michael, 1995) recommend for the USA a modified measure of a poverty threshold based upon a percentage of median expenditures on food, clothing and shelter. Even though this proposed measure does not specify the involvement of household production in defining income poverty threshold, it remains true that a low-budget household must economize by using a minimal amount of market input. The recommendation of the NRC committee explicitly allows for child-care expenses in estimating poverty threshold.[3] While out-of-pocket child-care expense is easily verifiable and accepted as legitimate in administering family assistance programs, a time-poor family may have to incur other expenses to substitute for home production (of meals, cleaning, etc.) if they have to maintain a targeted standard of living. Is it meaningful to define and measure the time-deficit and its money-equivalent for the purpose of adjusting the time poverty threshold? As discussed below, the studies by Vickery (1977) and Douthitt (1993), for the USA and Canada, respectively, have attempted to incorporate the money-value of time in determining poverty threshold, while the NRC panel has considered but decided against doing so. However, in our view, given its importance, it is imperative that work be undertaken to incorporate time into poverty measurement.

2. TIME-USE DATA AND ACCOUNTING FOR TIME

The amount of time potentially available for allocation is determined by the demographic composition of the household. As noted by Vickery, the ability of the household to convert the available time into consumption depends upon household productivity both in market and non-market work. Hence, it is necessary to have a clear understanding of how time is allocated. Time-use data provide a basis for that understanding[4].

A highly useful and meaningful classification, by Aas (1982), currently being adopted in the presentation of national time use study, identifies four main time categories: namely, contracted time, committed time, necessary time, and free time. Contracted time is time that by agreement has been set

aside to undertake paid work or education. One is obligated by the nature of the employment or educational contract to allocate time to these activities as appropriate. Committed time refers to time undertaken to maintain one's home and one's family. Necessary time is time required to maintain oneself in terms of eating, sleeping, bathing etc. Free time consists of the 24 hours of the day minus contracted, committed and necessary time. Free time is further broken into that which is deemed necessary for one's health and any additional free time. Both contracted and committed activities are viewed as productive work. The former is viewed as paid work and the latter as unpaid. There is a significant literature exploring the gender division of work. It shows that paid work activities tend to be dominated by males and unpaid work by females (Berk, 1985; Shelton, 1992; Gershuny, 2000). It points to an existing and increasingly heavy work burden for women resulting from the dual role in the household and in the labor market. Hence, in considering household production and productivity, one cannot dissociate time allocation from gender.

The current state of development of time-use data collection and analysis does not permit a clear delineation of categories of activity. Many activities are typically classified to one category but also belonging to another. Currently activities are assigned to one or another broad behavioral group falling under one or the other of the Aas categories. However, depending upon the context, the activity may well belong somewhere else or may cut across categories. In fact, the activity coding of the 1998 data provides two aggregated coding schemes: one for the 1998 data alone, and one that can be used to compare the 1992 and 1998 data. Unpaid work is one of the most affected categories. In this study, the comparable categorization was used.

When examining a person's allocation of time, it is assumed that from the allotted 24 hours, necessary time (including the necessary component of free time) must be subtracted, in order to give a supply of time (T_m) which a person is free to allocate between work and leisure. However, a person's freedom to allocate time is constrained by the requirement to maintain the household. The minimum time required to run the household is considered as the committed time (T_1). After further reducing their supply of time by that required for household commitments, a person is left with allocatable time (T_A). It is with this supply of time that a person can exercise his or her work-leisure choice. If a person contracts more time than they have available, it is assumed that they have cut into their committed time and have therefore not met the minimum amount of time required to tend to their household. People who do not meet this minimum requirement are considered to be time poor.

3. TIME POVERTY MEASURES AND TIME-ADJUSTED POVERTY THRESHOLD

In her pioneering model, Vickery (1977) presented a method of incorporating the concept of time poverty in defining poverty threshold. Figure 1, adapted from Vickery (1977), shows a combined money and time poverty threshold by the line CABD. The lower bound of the line is the baseline money poverty rate M_0 which defines borderline poverty only when it is assumed that a sufficient amount of time T_1 is devoted to household work in order to spend a minimal amount of money on purchased inputs. There is only T_m amount of time available to a household, leaving aside the necessary time for sleep and other essential personal care. If more than $(T_m - T_1)$ amount of time is used up in market work and related activities, leaving less than T_1 for household work, then the household has a time-deficit.

In this situation, additional money is needed to compensate for the deficit time so that market inputs can be purchased to substitute for household work[5]. This substitution of money for time is represented by the segment AB in the combined money and poverty threshold line CABD.

Vickery also assumed that, irrespective of financial resources, a household is to be considered time poor if less than T_0 amount of time is available to it. Likewise, the household is money poor, irrespective of the amount of available time, if it has less than M_0 amount of money. The area below and to the left of CABD, therefore, represents either time poverty, or money poverty or both.

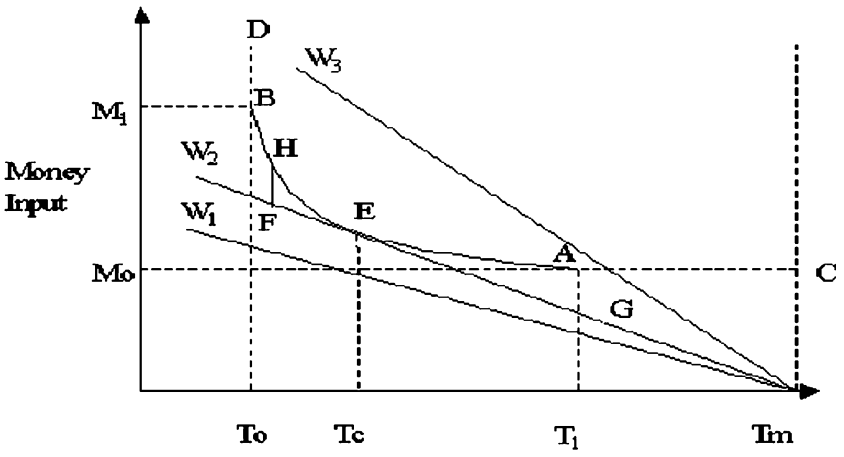

Fig. 1. Time adjustment of income poverty.

Using this basic framework of defining time poverty, Douthitt (1993) shed light on the incidence of time poverty in Canada[6] by estimating the extent to which different types of households suffer from time deficits in housework and personal care. Vickery (1977), however, looked at the potential incidence of time poverty through the indirect method of comparing the wage rate distribution with the wage rates needed to reach the poverty threshold. In Figure 1, this needed wage rate is the slope of the line W_2. At this wage rate, $(T_m - T_c)$ amount of market work will yield T_cE amount of income, taking the household to the poverty threshold. At a lower wage rate, with the wage-income line T_mW_1, the household never reaches the poverty threshold, and at a higher wage rate, with the wage-income line T_mW_3, the household will be above the poverty threshold. As pointed out explicitly in the Vickery model, this representation of poverty status by the wage rate is contingent upon the household being able to choose the number of hours of labor supply in the market. For, what happens if a household is observed to be at point F in Figure 1? F is below the time-adjusted poverty line, but if the household has the choice of working fewer hours and getting to point E, then at point F the household is voluntarily time poor. Likewise, a point to the right of E (e.g., point G) represents voluntary poverty where the household is choosing not to work enough hours. If it were true that someone is at point F or G out of choice, rejecting point E because of his or her own pattern of income-leisure preference, then the issue of involuntary time poverty could be expressed through the wage rate alone. In view of labor market imperfections, however, we cannot assume that one has the choice of working longer or shorter hours, so we do not adopt Vickery's wage rate configuration of time poverty.

The NRC panel (Citro and Michael, 1995) has elaborately argued against defining a money-equivalent of the free time many households have at their disposal. While we agree with this view, we do not share their general pessimism about converting time into money. Our approach is to convert the household time deficit into the money equivalent when we observe such deficit to exist. We do not know whether or not the individual had the option of working longer or shorter hours, so we do not assume that he or she had such an option. Thus if someone is observed to be at point F, for example, the monetary compensation of the time deficit would take that person vertically up to point H on the threshold level. We are thus attempting to convert only the time-deficit into money and not all free time into money. The fact that all free time cannot be converted into money should not prevent us from addressing the meaningful issue of ascribing a monetary value to time deficit.

Imputing a monetary equivalent to the time crunch suffered by the working poor is based upon the assumption that non-market household time can be replaced by purchased market inputs. For example, restaurant fast foods or take-out meals can supplement home-prepared meals. The conversion rate can thus be determined from the replacement cost of such substitution. Figure 1 shows a curved line for the line segment AB, representing continuously variable replacement costs for different household tasks, on the basis that a lower-cost replacement will be done before a higher-cost one. For empirical estimation, Vickery used alternative assumptions of constant and variable replacement costs, while Douthitt worked with the assumption of a constant replacement cost (as in Figure 2). Use of the variable replacement cost method involves the estimation of market prices for specific groups of tasks, which are then applied to the household tasks needing to be replaced. For the current analysis, we have adopted the simplified approach of using the minimum wage rate as the replacement cost, where the minimum wage is calculated as the population-weighted average of the minimum wage rates prevalent in the provinces of Canada during the time period in question. In 1998, this averaged $6.55 per hour. In further work we hope to move to a variable pricing approach linked to our previous work on valuing unpaid work (Harvey and Mukhopadhyay, 1996).

A household (or individual) is counted as poor if the household (individual) income falls below the poverty threshold or if the individual is absolutely time poor. In terms of Figure 2, points x and z represent poverty, but not the point y. For both the points x and y, the individual has a time deficit equaling T_1E, but x is below the threshold level AB, and therefore represents poverty, even though the money income is greater than the LIM threshold of M_0. Point z represents absolute poverty where the time deficit is greater than (T_1-T_0), so that the individual has less than T_0 amount of time available for household work, putting him or her in a time crunch that cannot be relieved by monetary substitution. Note that in deriving the poverty threshold line, we have used the minimum wage rate of $6.55 as the slope of the AB line in Figure 2, while M_0 and T_1 are specific to each household size and type.

4. TIME DEMANDS OF LONE AND DUAL PARENT FAMILIES

Earlier work has shown that lone parent families unquestionably suffer time poverty. Hence the study focuses primarily on them. However, dual parent families are included as a referent. Living arrangements, number of children

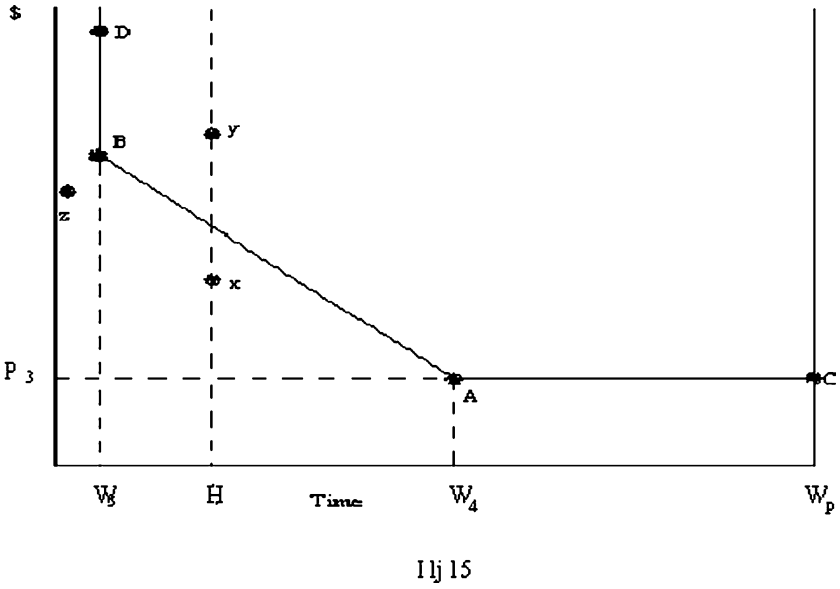

Fig. 2. The vickery model of time poverty.

under 15, and number of persons in household were used in this study to select subjects. The 12-category GSS variable "livarr12" was used to identify couples with children and lone parents. The present study is based upon these two groups in combination with the number of children. To get meaningful sample numbers, categories are limited to 1, and 2+ children for both couples and lone-parent families. The cases included here were calculated for lone parent and two parent families as the total number of persons in the household minus children under the age of fifteen. If the residual was one the family was a lone parent family. If the residual was two it was a two parent family. Hence, by the approach used the families examined consisted only of parents and children under the age of fifteen. There are no other individuals in the household either requiring time or providing time. In total 2241 families were examined, 396 lone parent families and 1845 dual parent families, (Table I).

4.1. *Derivation of T_m*

The T_{m} is the amount of time available, over and above what is required for personal maintenance, to allocate to work and leisure activities. It excludes

TABLE I

Demographic structure of study population, Canada, 1998

		Sample	Population	Column %
Sex of respondent	Male	924	2,233,816	47.0
	Female	1317	2,520,632	53.0
	Total	2241	4,754,448	100.0
Parent	Single	396	465,637	9.8
	Two	1845	4,288,811	90.2
	Total	2241	4,754,448	100.0
Number of children	One child	840	1,738,041	36.6
	Two or more children	1401	3,016,408	63.4
	Total	2241	4,754,448	100.0
Employment status of respondent	Non-employed	799	1,644,587	34.6
	Employed	1442	3,109,861	65.4
	Total	2241	4,754,448	100.0

Source: Statistics Canada, derived from General Social Survey Cycle 12 Public Use Sample Tape.

necessary or personal time, the time allocated to sleeping, dressing, eating, etc. For an estimate of this excluded time, Vickery used the average time of 10.2 hours per day (71 hours per week) derived from the United States 1966 Michigan time-use survey. We estimated comparable figure from the 1998 Canadian study to be 10.5 hours (Harvey et al., 2002). Additionally, Vickery added 10 hours a week for necessary leisure, time deemed necessary for re-creation. We have elsewhere argued for 2 hours per day, 14 hours per week (Harvey et al., 2002). This adds 2 hours to the 10.5 hours of necessary personal activities generating a total of 12.5 hours per day or 87.5 hours per week required for personal subsistence. Subtracted from 168 hours per week, this leaves a value for T_{m} of 80.5 hours per week or 11.5 hours per day over the 7-day week for an individual, or 161 hours per week and 23 hours per day for a two-parent family.

4.2. *Derivation of T_1: Required Household Work Minimum*

There is a second constraint on an individual's time, since, in order to maintain one's household, a block of time must be allocated to household demands. The block of time T_{l} represents what Aas (1982) called committed time. The derivation of T_{l} is shown in Table II.

Time-use data provide the basis for determining household time norms. Ideally one needs time-use data from all household participants or, barring

TABLE II

Unpaid household work, parents with children at home, Canada 1998

	Single No. of children		Couple No. of children	
	One child	Two or more children	One child	Two or more children
	Mean	Mean	Mean	Mean
Cooking/washing up	83	94	54	64
Housekeeping	91	103	62	56
Maintenance & repair	2	0	15	15
Other household work	12	17	29	22
Shopping for goods/services	66	73	47	54
Child care	192	203	112	121
Total minutes per day	445.4	491.3	319.9	332.1
Hours per week	52.0	57.3	74.6	77.4

Source: Statistics Canada, derived from GSS12 Public use file. Based on households with at least one homemaker.

that, at least data from household partners. Unfortunately, the GSS collects data from only one member per household. Consequently, the couple estimates provided here come from synthetic families combining males and females in similar circumstances.

The T_1 reflects the minimal amount of time, given the structure of a household, required to prepare and cleanup from household meals, attend to other housework including housekeeping, clothes care, home maintenance, and shopping. This is also known as committed time. As pointed out by Vickery (1977), the true minimum should be determined in the absence of any purchased inputs of goods and services designed to save time. Meals should be prepared from fresh ingredients only, clothes washed and dried without mechanical aids and housecleaning carried out without the aid of mechanical appliances. Only time captured under such conditions can be considered to reflect the true minimum time required to maintain a household. The minimum time presented here will tend to be lower than the true minimum effort required since it has built in many time-saving acts already.

Following Vickery and Douthitt, the minimums were established from households in which either the selected respondent or their spouse ($N = 2241$) reported homemaker as their main activity ($N = 842$). Vickery made one exception. She argued that since housekeeping was subject to great variation relative to other components of household work, time

allocated to it might be inflated. She used the time allocation of full-time employed women for housekeeping. However, analysis of the GSS data suggested that such an adjustment made only a small difference (2 hours per week) to the overall norm used in this study, and thus housekeeping was treated like all other components of unpaid work time. In essence this offsets time saved by using time saving goods and services.

Calculations of unpaid work were based on variables in the 1998 GSS data set designed to be comparable to the GSS 1992 time-use data. The variables used were cookdoms + maindoms + othrdoms + shopdoms + hskpdoms + chlddoms, Table II. Minimum required hours (T_1) ranged from 52 hours per week for lone parent families with one child to 77.5 hours for a couple with two or more children (Table II).

While diaries were collected from each respondent for only one day, the results used here reflect an average a day in a 7-day week. The data, collected for all 7 days of the week, are weighted to ensure equal representation of each day. However, since this study used only a selected subset of the complete data set further weighting was carried out to ensure equal daily representation of the sample used in this study.

4.3. *Available Time, Paid work hours and Time Surplus/Deficit*

The T_m less T_1 yields the amount of time available (T_A) for allocation by the respondent to paid work and leisure. T_A indicates the amount of time freely at the disposal of the individual or household, the time that can unequivocally be allocated between work and leisure, or as Aas put it, between contracted and free time. If it is sufficient, it will provide adequate time for the individual to engage in paid labor and have some free time. If, however, the individual engages in a contract which requires or elicits more time than T_A not only does the individual not have any free time but he or she must cut into required household time as discussed elsewhere. Allocatable household time ranged from 23 hours a week in a lone parent family with two or more children to 86 hours a week in a two-parent household with one child (Table III).

Paid work hours were derived from the GSS data. The survey asked the respondent for both their normal weekly hours of work and for the weekly hours of their spouse, if relevant. Paid hours of work per week shows the combined household hours in couple households. This value, subtracted from the time available (T_A) shows the extent of the time surplus (+) or deficit (−) facing the household. Only employed single parents as a group

TABLE III

Time poverty accounting, families with children, Canada 1998

Parent(s)		Non-necessary T_m Hours/wk	Required committed time T_1 Hours/wk	Allocatable time T_A Hours/wk	Total paid work hours in household		Time surplus (+) or shortage (−) = T_A−Household paid work hours	
					Non-employed Hours/wk	Employed Hours/wk	Non-employed Hours/wk	Employed Hours/wk
Single	One child	80.50	51.96	28.54	2.46	38.80	26.07	−10.27
	Two or more children	80.50	57.32	23.18	1.84	40.00	21.34	−16.82
Two	One child	161.00	74.64	86.36	33.08	69.93	53.28	16.43
	Two or more children	161.00	77.51	83.49	36.24	71.46	47.25	12.03

Source: Statistics Canada, derived from GSS12 Public use file.

registers a time deficit which requires them to earn and allocate income to purchase services in the market.

5. DERIVATION OF TIME-ADJUSTED POVERTY THRESHOLD

Earlier in this paper, we have discussed the alternative approaches to measuring income poverty. In this study the LIM cutoffs were used in order to establish poverty levels for various household configurations. Table IV shows the weekly LIM cutoffs and household weekly income[7] for the subject groups in this study. The weekly cut off ranges from $364.35 to $520.52 for lone parents with one child to a couple with two or more children, respectively. Weekly income ranges from $487.08 to $1,150.17 between the same two groups.

As previously discussed, households experiencing a time deficit will find it necessary to purchase services in the market to compensate for the time they are unable to devote to committed household tasks. Hence, each family must receive income compensation to offset these necessary expenditures. Also as indicated above, the authors have accepted the national average minimum wage of $6.55 as an appropriate financial offset in the absence of better information. Assuming the average of $6.55 an hour, the weekly compensation due a household would be $6.55 times the weekly hour shortage as determined in Table III. Actual deficits occurred only for lone parent family groups.

Household time adjusted income cutoffs are determined by adding the value of the time deficit to the weekly LIM cutoff. This allows the household to obtain required services without taking funds used to determine the non-adjusted cutoff. Time adjusted cutoffs range from $367.89 for a single family with one child to $569.13 for two parent family with two or more children, Table IV. For single parents with 2+ children the adjustment amounts to 25% of the LIM cutoff.

5.1. *Incidence and Types of Time Poverty*

The data indicate that it is virtually impossible for employed single parents to escape time poverty. The tradeoff between time and money poverty is abundantly clear in Table V. On the one hand, the single parents who are not employed register between 50 and 60% below the income cut off in contrast to 26–31% were they employed. On the other hand, only 3% of those who are not employed are time poor while 88 and 98% of employed single parents show as time poor, Table V. Only 4 and 8% of non-employed

TABLE IV

Income poverty accounting, families with children, Canada 1998

			Weekly LIM cutoff Mean	Weekly monetary value of time deficit Mean	Time adjusted income cutoff Mean	Annual monetary value of time deficit Mean	Household weekly income Mean
Single parent	One child	Non-employed	364.35	3.54	367.89	184.16	299.79
		Employed	364.35	76.95	441.30	4001.42	614.42
	Two or more children	Non-employed	442.47	3.79	446.26	197.27	346.17
		Employed	442.47	111.03	553.50	5773.59	666.61
Two parents	One child	Non-employed	442.47	6.96	449.43	361.73	823.39
		Employed	442.47	23.61	466.08	1227.68	1168.28
	Two or more children	Non-employed	538.66	5.99	544.65	311.72	941.96
		Employed	538.66	30.47	569.13	1584.55	1246.55
Total	One child	Non-employed	417.64	5.87	423.51	305.29	654.69
		Employed	424.90	35.60	460.51	1851.36	1047.90
	Two or more children	Non-employed	520.47	5.58	526.05	290.08	831.97
		Employed	529.62	38.04	567.66	1978.32	1190.47

Source: Statistics Canada, derived from GSS12 Public use file.

TABLE V

Incidence of time poverty

			N	Income poor Percent	Time poor Percent	Adjusted income poor Percent	Absolute time poverty Percent
Non employed	Single	One child	96	60	3	60	0
		Two or more children	94	50	3	52	0
	Two	One child	206	13	4	15	0
		Two or more children	403	18	8	19	0
Employed	Single	One child	121	26	88	31	1
		Two or more children	85	31	98	48	2
	Two	One child	417	4	20	5	1
		Two or more children	819	7	30	7	0

two-parent families register time poverty, 20–30% show as time poor when they are employed.

The existence of time poverty exacerbates problems generated by income poverty. In some cases families will only be subject to income poverty and in other cases only subject to time poverty. However, the possibility exists for families to suffer from both at the same time. In fact, five poverty situations exist. First, it is possible a family will be neither income nor time poor. And, they may be income poor, time poor, or both. Finally, while not income poor when not accounting for time, they may become income poor requiring adjustments to be made to enable them to purchase goods and services required to undertake household commitments they are otherwise unable to accomplish due to lack of time.

The extreme situation of single employed parents is obvious in Table VI where only 5.3% of this group are subject to neither money nor time poverty. While over 54% of non-employed single parents are money poor well over 58% of employed single parents are time poor. In contrast, in dual parent families over three quarters (77.5%) are neither money nor time poverty. The tradeoff between time and money is immediately obvious in examining Table VI. There it can be seen that employed individuals, while not income poor, are time poor. For example, over 80% of single employed parents are time poor.

Figure 3 illustrates the several types of time poverty and provides an indication of their allocation in the population studied here. Only 18% of this

TABLE VI

Types of poverty

	Single Employment Status of respondent		Two Employment status of respondent	
	Non-employed Column %	Employed Column %	Non-employed Column %	Employed Column %
Not money or time poor	42.6	5.3	77.5	68.4
Time poor not adjusted money poor	1.6	58.7	5.1	25.1
Money poor/not time poor	54.2	2.9	15.9	4.9
Time & money poor	1.1	25.2	0.7	1.1
Not money poor but time adjusted poor	0.5	7.8	0.8	0.6
$N=$	190	206	609	1236

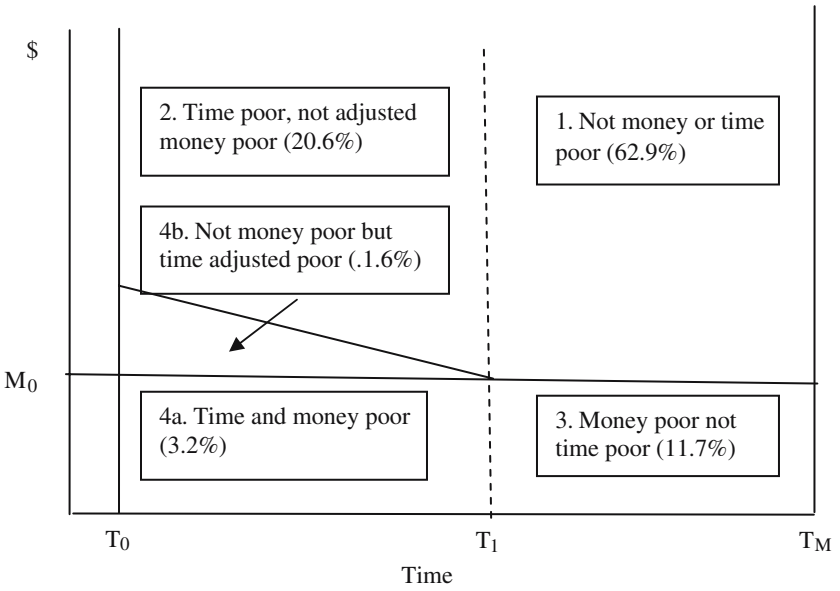

Fig. 3. Types of time poverty for parents with children.

population consists of single parents (396 out of 2241 households, Table I), thus the poverty picture in Figure 3 is not as stark as when we focus on the plight of the single parents. Overall, about two-thirds of the population was neither time nor money poor. The second largest proportion, 20.6%, was time poor but not money poor. This group, while short of time, can afford to purchase goods and services to substitute for household time input. That is, after purchasing the goods and services they need for such substitution, they would still be above the income cutoff. The next two groups are the 'money poor not time poor' and those who are time and money poor. Finally, 1.6% of the overall population examined here was forced below the income cutoff as they spent income to offset the household time allocated to paid work. Hence, about 5% (4a and 4b) of the population is doubly stressed by suffering combined time and money poverty. They have neither the time to allocate to their family nor the income to make up for it.

6. CONCLUDING REMARKS

Our effort in this paper has been to delineate the time-adjusted poverty threshold for families with children, based on the time use survey data for 1998 in Canada. The focus here has been on families and more specifically

single parent families. As expected, we have found high incidence of time deficit among the employed single parents with children. We have not addressed the gender issue here since there are very few single fathers and additionally single fathers must meet most of the same challenges that single mothers face.

This study, and our earlier work, suggest two areas needing extensive study if time poverty research is to move forward. First it is important to establish better estimates for the relevant time allocation norms required. These include personal care time including sleep, daily re-recreation need, and finally household and family maintenance time. Second, attention needs to be given to understanding the time-purchase curve. How do families combine purchased goods and services in order to offset time shortages? Little is understood about this tradeoff. Understanding these points is necessary not only for understanding time poverty, a better understanding of them is important for both the physical and mental well-being of individuals since the information can lead to a better understanding of the needs of people with respect to both paid and unpaid work demands. An additional area requiring study is the temporal-spatial background against which the time demands must be met. Time related problems may easily exist in the scheduling and location of activities in the presence of adequate total time.

NOTES

[1] For example, the Human Development Index and the Human Poverty Index by UNDP. See Klasen (2000) for a cogent review of the different measures of poverty, as well as for a comparison, based on South African data, of a broad deprivation measure of poverty with an expenditure measure (similar to income measure) of poverty.

[2] This characterization of MBM as an absolute measure is generally considered acceptable even though the concept of what is a necessary basket to consume evolves over time, and is different between rich and poor countries.

[3] Child-care expenses are to be deducted from money income in defining total family resources. Similarly, there are other deductions such as out-of-pocket medical costs and taxes.

[4] Time-use data for the analysis here are drawn from the Canadian General Social Survey, Cycle 12, carried out in 1998; Statistics Canada, 1998a, b). The target population for the GSS includes all persons 15 years of age and over residing in Canada, except residents of the Yukon and Northwest Territories and full-time residents of institutions. Since all respondents were contacted by telephone, households without telephones were excluded. Persons living in such households reportedly represent less than 2% of the target population (Statistics Canada, 1998b). Survey estimates were weighted to account for persons without telephones. The data were collected monthly from February 1998 through January 1999 inclusive and were evenly distributed over the 12 months to represent the seasonal variation in the information. The sample was selected by Random Digit Dialling (RDD) after eliminating non-working banks of phone numbers. To account for variation in people's activities by the day of the week, the sample was designed to be representative of each day of the week by assigning each telephone number a "designated day." Data were eligible for collection for 2 days following the desig-

nated day. An attempt was made to conduct the interview with one randomly selected person from each household. The data for Cycle 12 were collected using Computer-Assisted Telephone Interviewing (CATI) using Computer-Assisted Survey Execution System software (CASES) (Statistics Canada, 1998b). The completed sample was 10749 respondents. The use of RDD and phones can be expected to bias the population on which the GSS is based against the low-income population since it is likely that they constitute a high proportion of the 2% without phones.

[5] The segment AB will be a straight line if the money cost of replacing time is constant. In general, AB can be considered non-linear, representing differing replacement costs for different elements of household work.

[6] The data used were the 1986 Canadian General Social Survey Public Use Micro Data File on Time Use, Social Mobility and Language Use.

[7] Household income is given in the GSS by income group. The mid-point of the range for the household's income group was assigned as the income for the household. In order to make the sample data more consistent with published figures, incomes were scaled such that the mean income for each group matched those published by Statistics Canada for 1998 (see Harvey et al. (2002) for details of the adjustment procedure).

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