The 1996 Census Unpaid Work Data Evaluation Study

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PREFACE

The decision to produce the *1996 Census Unpaid Work Data Studies* originated from Status of Women Canada's discussions with the Policy Research Fund External Committee during the spring of 1998. The Committee identified unpaid care-giving work as an urgent policy research issue requiring immediate attention. Statistics Canada was approached to provide an early analysis of the data coming out of the 1996 Census of Canada which, for the first time, contained three questions concerning unpaid work.

The 1996 Census Unpaid Work Data Studies will consist of a series of three studies. This first paper is an evaluation study aimed at assessing key aspects of the *quality* of census unpaid work data. Aspects of fathering and elder care will be the subjects of two other analytical studies that Status of Women Canada expects to publish, also based on the 1996 Census data on unpaid work. The work on fathering will include additional information about patterns of sharing of child-care work by household members, other than the father and mother, thanks to the fact that the 1996 Census broke important ground in obtaining the relevant data from all members (aged 15 or more) in the sample households.

The data on unpaid work can be used to produce research results that are applicable in a wide variety of policy fields including:

- the adequacy of child-care arrangements available to meet existing needs;

- planning and delivery of assistance for those who devote large portions of their time to providing personal services to the needy elderly;

- the linkages among hospital services, community care services and family-level informal care;

- using the tax system to recognize and compensate unpaid work that is vital to the well-being of Canadians and the integrity of Canadian society;

- family-friendly workplace policies, training policies and employee benefit policies; and

- impacts on child care when the household is the major venue for the family's market production (e.g., farm households, households where the home is also the place of business for the self-employed).

A better understanding of the links between paid and unpaid work—market and non-market work—has long been identified by feminist activists and academics as critical to understanding inequality between women and men, and to developing more equitable policies. In Canada, where measurement and valuation capacity is among the best in the world, attention has shifted to policy implications. The presence of the questions on unpaid

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work in the 1996 Census and the subsequent collection and analysis of the data will make a significant and important contribution to these discussions by:

- drawing attention to the existence and importance of work done outside the paid work force;

- allowing for the systematic collection of high-quality information across the country (This is especially significant for provincial and sub-provincial jurisdictions, which often can receive no data based on national surveys due to problems with small sample sizes or due to being totally omitted from the national surveys, for example, the Territories.); and

- contributing to the creation of the largest data set dealing with unpaid work in Canada as well as a richer and more useful data set as subsequent iterations of the Census of Canada capture the same information—allowing for better and more reliable analyses over time.

Status of Women Canada's objective is to enhance public debate on gender equality issues and to enable individuals, organizations, policy makers and policy analysts to participate more effectively in the development of policy. We are pleased to support this work, and we thank the analysts at Statistics Canada for their significant and timely contributions.

ACKNOWLEDGMENTS

IMPORTANCE OF THE CENSUS UNPAID WORK DATA
AND MAIN ISSUES ADDRESSED IN THE EVALUATION STUDY

Introduction

No existing body of statistics is without important limitations. New kinds of statistics are especially subject to improvements as experience with their uses grows. The new 1996 Census data on aspects of unpaid work are no exception to this rule. Despite the limitations, with ingenious and imaginative applications of statistical estimation procedures (yet no more imaginative than what we now see in the commonly accepted usage of simulations and synthetic data in support of policy analysis and development), the 1996 Census data on unpaid work can be used to produce research results that are applicable in a wide variety of policy fields.

Precisely because these are brand new data in the context of a census, an essential foundation for their substantial analysis is the conduct of evaluation studies aimed at assessing key aspects of the quality of these data. First, some useful notion of "overall quality" needs to be developed and then applied in an evaluation of the census unpaid work data relative to the range of quality characteristic of census data concerning questions considered to be legitimate and established for use in a national census. If the overall quality is judged to be within that range, then it is valuable to identify major population subgroups where the quality is especially weak or better than average in some useful sense. It is also important to identify large classes of analytical applications that are blocked because of peculiarities in the census questions or in the subsequent representation of the census results on the census master file at Statistics Canada. The challenge of conducting these evaluations has been partly addressed in three recently completed studies, which are now brought together as the subsequent chapters of this document. Related information, focussed on opportunities and limitations for analysis purposes, can be found in Stone and Silver (1998a).

Once there is a positive decision to harness the census vehicle for delivering data about unpaid work (as happened with the 1996 Census), and the data are gathered, a new evaluation process of potentially national significance begins to unfold.

Main Issues Addressed

A summary of the issues addressed in each paper follows.

Paper 1 assesses the quality of the estimates for the three kinds of unpaid work covered in the 1996 Census through an examination of the non-response rates and the scale of imputations due to manifestly inappropriate responses. The question addressed is whether the census estimates of the volumes of unpaid work are of a minimum acceptable quality that would warrant their use in further analyses of unpaid work for various sub-populations of Canadian society, where quality is evaluated only from the perspectives just cited.

Paper 2 evaluates the quality of the results of the 1996 Census questions on unpaid housework, unpaid child care and unpaid care to seniors, by comparisons with data yielded by identical questions asked on the 1996 General Social Survey (GSS). The key question addressed in this evaluation is: What are the quality implications of the differences between the 1996 GSS and the 1996 Census, given that identical questions were used, when we compute similar distributions (e.g., the distribution of respondents over categories of time spent in child-care work) using the two data sources?

Paper 3 evaluates the quality of the results of the 1996 Census questions on unpaid housework and unpaid child care, by means of comparisons with data yielded by the time-diary data from the 1992 GSS. This study tests whether certain patterns of difference between diary and stylized data (the census questions fall into the latter class), as described by the literature, are found in reasonably comparable data for selected distributions from the 1992 GSS and the 1996 Census. Only the census questions on housework and child-care activity are addressed in this paper, as the GSS diary data are not suitable for an analysis of time spent on care to seniors.

Selected Findings

The following capsule summary of key findings from all the papers may be useful for the reader who does not have the time to plough through all three studies.

The first two evaluation papers have found the census unpaid work data to be within the "quality range" relative to much more established census variables. The worst case is child care—it is close to the low end of the quality range when the comparison is with the same question asked in the 1996 GSS (see Paper 2). (This "same question" is not the time-diary, child-care data discussed above.)

However, for a major segment of the population—adults aged 25 to 64 with post-secondary education, particularly those in the labour market—the census and GSS data compare very well, once the sources of non-comparability between the two data sets are considered. For this population, it is hard to say which data source is better. As there are some subtle concepts in the framing of census-type, time-use questions in connection with caring work, it is conceivable that better education means a better chance to appreciate and respond appropriately to these questions.

For certain key groups—the unemployed, those with low education, exotic ethnic/language groups—the census data should be used with great caution. However, for these same groups, the GSS sample size is often so small that neither source looks good from a quality perspective.

The response categories used in the unpaid work questions are a major weakness of the census data. A key task will be to fix the categories to make them more useful for analysis purposes.

Finally, one other advantage of the census cannot be overlooked: its large sample size and its subsequent ability to provide data at the sub-provincial level or for any number of special

sub-populations of interest. This is of particular significance as the focus of much social policy is below the national level, at the provincial, sub-provincial and even community levels.

Major Observations on the Findings

The findings developed in papers 1 to 3 give rise to a number of important general observations of conclusions that deserve to be highlighted.

First, because they deal only with housework and with caring work on behalf of children and seniors, no estimate of any defined *total volume of unpaid work* can be made from the census. Hence, debates over whether group A is doing more unpaid work than group B, after considering their sizes and other factors that must be controlled, cannot be supported by the census data. Rather, analyses about the specific sub-fields of unpaid work are what should be considered with these data. Fortunately, the 1996 Census questions include fields where there is major public interest.

Second, because census respondents provided their information in terms of broad categories of time spent doing specific classes of unpaid work, and with a substantial open-ended category included, estimates of time spent doing particular kinds of work cannot be routinely retrieved in census tabulations. Instead, statistical models have to be developed and applied to transform responses initially given in terms of broad categories into estimated numbers that can be added to produce simulated totals. With regard to the 1996 Census data on time spent doing child-caring work, such a model has already been built, tested and used (see Stone and Silver, 1998b).[1]

Third, much more extensive use of the data on time spent helping seniors would be possible if there was an additional question designed to allow analysts to identify the respondents who had little or no opportunity to provide help to any senior. The lack of this additional question limits the analysis of these data to situations where a census respondent lives with a senior, especially as a family member or other relative. Fortunately, the census sample of such households is much greater and more useful to provincial jurisdictions (the main venues for policies and programs, and services to the elderly) than the sample available from any Statistics Canada survey.

Because the census also has data on the disability statuses of all the household members, this data resource becomes a centrepiece of the informational support to debates (and related program planning) related to the volume and distribution of *informal* home care activities among a wide variety of Canadian sub-populations.

Fourth, with regard to child-caring work, it is almost totally misleading to suggest that the GSS time-diary estimates of time spent doing child caring *as a primary activity* are comparable (let alone superior) to the census-type, stylized question ("how many hours did you spend…"). Paper 3 conclusively supports the proposition that fundamentally different variables are involved. (An analogy would be to confuse total income defined in terms of what one receives in return for labour output with total income in terms of both labour

output and many other kinds of income source such as investment income. They are simply two fundamentally different kinds of totals.)

The superiority of the census-type question arises from the fact that it implies reference to a much broader concept of child-caring work than does the GSS time-diary data that focusses on measuring primary activities only. Among child-care analysts and mothers, this broader concept is far more likely to be judged useful, than the primary-activity concept of the time-diary data. Hence, if the GSS is a serious alternative to the census, as a source of data on time spent doing child-care work, it will be through the use of the census-type question in a GSS (and not via the GSS time-diary data, unless these are accompanied by a supplementary child-care diary). This is an important conclusion, because the major opposition to unpaid work data in the census, on grounds of defective quality, is based on the alleged superiority of time-diary data. We are saying that, on the contrary, as far as child care is concerned, time-diary data that measure only primary activities are an inferior substitute for the census-type question.

It follows that for access to time-use data involving the more comprehensive and useful concept of child-caring work in a context where a variety of key population subgroups need representation through adequate sub-sample sizes, the national surveys offer no substitute for the census. The census is the only source that can deliver the needed information.

Finally, taking note of the fact that the GSS is the vehicle thought to provide data on time use that are superior to what can be obtained in a census, the papers show that there is a very large sub-population of Canadians where the alleged superiority of the GSS data is extremely difficult to establish with regards to the three items covered in the census (to state the case most favourably for the GSS).

PAPER 1: NON-RESPONSE AND IMPUTATION
FOR MULTIPLE RESPONSES

Introduction

This paper assesses, in general terms, the quality of the estimates for the three kinds of unpaid work covered in the 1996 Census through an examination of the non-response rates and imputation of the data. The question addressed is whether the census estimates of the volumes of unpaid work are of a minimum acceptable quality to warrant their use in further analyses of unpaid work for various sub-populations of Canadian society. (For a summary of the findings, see the end of this paper.)

Background

Questions on unpaid work were included on the census for the first time in 1996. Information was collected for a sample of one in five households using the 2B (long form) questionnaire.[2] All respondents aged 15 and over, excluding full-time residents of institutions, were asked the questions on unpaid work.

There were three questions. Respondents were asked to report the number of hours spent in the week prior to enumeration, doing (1) *unpaid housework,* (2) *unpaid child care* and (3) *unpaid care or assistance to seniors.* Respondents were to check the box for the category which contained the number of hours they spent doing each activity. (See Appendix 1.A for a copy of the questions as they appeared on the questionnaire and the accompanying instructions from the guide.)

An important concept here is that of "*overlapping activity*." This phrase points to periods of time when the respondent was simultaneously carrying on activities in at least two of the three areas named above. For example, doing housework and child care at the same time would represent overlapping activity. In instances of overlapping activities, respondents were asked to report the time spent in both areas, e.g., counting the same time in both the housework and the child-care questions.

Data Quality

Once the completed questionnaires were returned from the field, the responses were data captured at one of the seven Revenue Canada processing centres across Canada. The captured data was then transferred to Statistics Canada to be loaded onto a data base for further processing.

Before processing begins, the incoming data are examined for indications of respondent comprehension and difficulties answering the questions, as well as any resistance to potentially sensitive or intrusive questions. Two indicators used to evaluate these problems are the non-response rate and the multiple response rate where only one response is appropriate.

Non-Response Rate

The non-response rate is defined as the number of persons in a given category of the population who did not answer a particular census question *when they should have*, divided by the total population of that category who should have answered the question. For example, since all respondents aged 15 and over (excluding institutional residents) should have answered the questions on unpaid work, the non-response rate for a given unpaid work question (e.g., housework) would be calculated as:

<u>The number of persons 15 and over with no response for unpaid housework</u>
The total number of persons aged 15 and over

Non-response rates can be calculated for each question appearing on the census questionnaire. They can also be calculated for any subgroup of interest in the population, for example, all residents of Ontario or persons aged 65 and over.

A high non-response rate (i.e., one that is generally higher than that of other census questions or population subgroups) can indicate one or more potential problems. Respondents might not have understood the question clearly or found the question too difficult and, therefore, were unable to provide an answer. Or, it can indicate that respondents found the question so intrusive or sensitive that they refused to answer (e.g., common-law status or income). Finally, respondents may not answer a question because they think it does not apply to them.

For example, the marital status question is asked of all household members, even young children. However, many respondents leave this question blank for their children (marital status is not applicable to children) rather than indicate SINGLE.

Table 1.1 presents the unweighted[3] non-response rates for the three unpaid work variables in comparison with the non-response rates for several other census questions. The selected questions vary in their degree of difficulty and sensitivity for the respondents.

Looking at the rates for the unpaid work questions, the data show the question on unpaid housework to have the lowest non-response rate at 1.5%, while the question on unpaid child care has the highest rate at 3.9%. Non-response for the question on care of seniors is 2.6%.

Compared to the other census questions, the one on unpaid housework has a relatively low rate of non-response, while the question on unpaid care to seniors falls more or less in the middle. The rate for unpaid child care, by contrast, is relatively higher, approaching that seen for the questions on common-law status and ethnic origin, although not as high as the rates for industry or income—questions which many respondents find difficult to answer.

Table 1.1 Comparison of the Non-Response Rates of the Unpaid Work Questions with Selected Census Questions (20% sample data – unweighted)		
Question no.	**Question**	**Non-response rate**
Q5	Marital status	1.9*
Q6	Common-law status	4.2*
Q13	Place of birth	0.9
Q17	Ethnic origin	4.1
Q24	Elementary/secondary school	2.9
Q25	Years of university	1.7
Q26	Years of college	2.2
Q30A	Unpaid housework	1.5
Q30B	Unpaid child care	3.9
Q30C	Unpaid care to seniors	2.6
Q31	Hours of paid work	1.5
Q34	Looked for work	2.9
Q36	When last worked	2.7
Q37/38	Industry	4.6
Q45	Weeks worked in 1995	3.9
Q47	Income	5.2

Note:
* Based on 100% data from the 1996 Census.

The low non-response rate for the housework question suggests respondents generally did not have difficulty understanding or answering this question, nor did they find it too intrusive. Given this result, it is unlikely that respondents would have judged the questions on child care or care to seniors as being unduly sensitive. Although many respondents may have had trouble deciding which particular behaviours constituted caring, our hypothesis is that the higher non-response rates for these two questions, in particular the one on unpaid child care, is more likely attributable to the tendency for some respondents to skip questions they think do not apply to them. For example, persons without children may have left the child-care question blank rather than check the NONE box, although some of these persons may have provided unpaid child care to the children of others.

Table 1.2 presents the unweighted non-response rates for the unpaid work variables, comparing the rates of men and women in each province and territory. It shows that:

- Men had higher non-response rates than women.

- Yukon had the highest rates of non-response for all three variables.

- The Northwest Territories had the second highest rate for the housework question; however, British Columbia had the second highest rate for the questions on unpaid child care and care of seniors.

- Newfoundland, Quebec and New Brunswick generally had the lowest rates of non-response for the three variables.

To elaborate on these points, the fact that men had consistently higher non-response rates than women may be further evidence of our hypothesis that some respondents skip questions they think don't apply to them. It would not be surprising to find some respondents who thought the questions on unpaid work applied only to women.

**Table 1.2 Non-Response Rates, by Sex for Unpaid Work Variables
for Canada, Provinces and Territories**

(20% sample data – unweighted)

	Housework			Child care			Care of seniors		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Canada	1.5	1.6	1.4	3.9	4.1	3.6	2.6	2.7	2.4
Newfoundland	1.0	1.0	1.0	2.9	3.0	2.8	1.7	1.7	1.6
Prince Edward Island	1.4	1.5	1.2	4.2	4.5	3.9	2.6	2.8	2.4
Nova Scotia	1.3	1.3	1.2	4.2	4.5	3.9	2.4	2.5	2.4
New Brunswick	1.4	1.5	1.3	3.6	4.1	3.2	2.2	2.4	2.0
Quebec	1.3	1.3	1.2	2.7	2.8	2.5	2.2	2.2	2.2
Ontario	1.5	1.7	1.4	4.3	4.6	4.0	2.7	2.9	2.5
Manitoba	1.2	1.3	1.1	3.4	3.7	3.2	2.0	2.2	1.9
Saskatchewan	1.2	1.3	1.2	3.6	3.8	3.4	2.2	2.3	2.1
Alberta	1.6	1.7	1.4	4.2	4.5	3.8	2.5	2.7	2.3
British Columbia	1.9	2.1	1.8	5.0	5.4	4.7	3.3	3.6	3.1
Yukon	5.1	5.6	4.4	6.7	7.4	5.9	5.7	6.4	4.8
Northwest Territories	2.2	2.3	2.1	3.2	3.4	3.1	2.7	2.8	2.6

**Table 1.3 Comparison of the Non-Response Rates of the Unpaid Work Questions with
Selected Census Questions, Canada, Provinces and Territories**

(20% sample data – unweighted)

	Place of birth	Years of university	Years of college	Unpaid house-work	Unpaid child care	Unpaid care of seniors	Hours of paid work	Looked for work	When last worked	Industry	Weeks worked in 1995
Canada	0.9	1.7	2.2	1.5	3.9	2.6	1.5	2.9	2.7	4.6	3.9
Newfoundland	0.3	0.9	1.3	1.0	2.9	1.7	1.1	1.8	1.4	4.4	3.4
Prince Edward Island	0.6	1.6	2.2	1.4	4.2	2.6	1.6	3.0	2.6	4.4	3.6
Nova Scotia	0.5	1.4	1.9	1.3	4.2	2.4	1.3	2.4	2.0	4.6	3.5
New Brunswick	0.9	1.5	1.9	1.4	3.6	2.2	1.4	2.6	2.2	4.7	3.6
Quebec	0.7	1.4	2.0	1.3	2.7	2.2	1.3	2.7	2.4	3.9	3.7
Ontario	1.0	1.8	2.3	1.5	4.3	2.7	1.6	3.1	2.8	5.1	4.0
Manitoba	0.6	1.4	1.8	1.2	3.4	2.0	1.3	2.6	2.2	3.7	3.2
Saskatchewan	0.6	1.4	1.8	1.2	3.6	2.2	1.4	2.9	2.5	4.4	3.4
Alberta	0.8	1.7	2.1	1.6	4.2	2.5	1.6	3.0	2.7	4.4	3.8
British Columbia	1.2	2.2	2.7	1.9	5.0	3.3	2.0	3.6	3.3	5.2	4.7
Yukon	3.7	5.2	5.6	5.1	6.7	5.7	4.8	7.0	6.1	6.7	6.4
Northwest Territories	1.5	2.6	3.1	2.2	3.2	2.7	2.2	3.9	3.5	3.2	3.5

However, the possibility that men do not identify their household work with the questions on unpaid work has implications for the quality of the census estimates: Is the amount of time spent by men on unpaid work underreported? The distribution of the census data for men will be of particular interest when we examine the quality of the census estimates in subsequent reports.

The second observation regarding the high non-response rate for Yukon is not a situation that is unique to the questions on unpaid work. As Table 1.3 shows, in all the census questions for which provincial data were available, the non-response rates for Yukon were the highest. Similarly, the next highest rates alternated between the Northwest Territories and British Columbia. Thus, while we should be cautious about using unpaid work data from the Yukon, this caution applies to other census variables as well.

Multiple Response Rate

The second indicator used to evaluate respondents' comprehension and reaction to a particular census question is the multiple response rate for an item where only a single response is appropriate. Erroneous multiple responses occur when a respondent provides more than one valid answer to a question but only one response is appropriate. (In the case of unpaid work, the respondent checked more than one "hours" category for a given unpaid work question.) This concept gives rise to the definition of an "erroneous multiple response rate," which is the number of erroneous multiple responses per 10,000 responses made.

Table 1.4 Comparison of the Multiple Response Rates of the Unpaid Work Questions with Selected Census Questions
(20% sample data – unweighted)

Question no.	Question	Multiple response rate (per 10,000 responses)
Q5	Marital status	10*
Q13	Place of birth	28
Q30A	Unpaid housework	77
Q30B	Unpaid child care	39
Q30C	Unpaid care to seniors	18
Q34	Looked for work	31
Q36	When last worked	63
Q41	Class of worker	51

Note:
* Based on 100% data from the 1996 Census.

Table 1.4 shows the unweighted multiple response rate for the census unpaid work questions in comparison with other census questions similar in format to those on unpaid work (i.e., questions where the respondent was to check one box from a selection).

A key observation is that the absolute level of erroneous multiple responses is, in fact, extremely low—scarcely high enough to affect any statistic based on a sample of at least 1,000 respondents. For example, the question on unpaid housework had the highest rate at about 77 erroneous multiple responses per 10,000 responses, while the questions on child care and care of seniors had approximately 39 cases per 10,000 and 18 cases per 10,000 respectively.

Although the absolute levels of erroneous multiple response rates are very low, the rate for responses concerning unpaid housework are the highest among the set of census variables for which data are available. (The next highest rate was 63 cases per 10,000 responses for the question on when last worked.) In contrast, the rates for the other two unpaid work questions are close to the lowest figures shown in Table 1.4. These figures pertain to marital status and place of birth, where one would expect extremely low levels of erroneous multiple responses. These observations indicate data of acceptable quality, from the perspective of this particular indicator, in at least two of the census unpaid work questions.

There is no implication here that the data on unpaid housework should be regarded as being of bad quality, since the absolute level of the indicator is extremely low. However, these results may be a warning that this variable deserves special attention as we develop our upcoming appraisals of data quality using other indicators.

The higher multiple response rate for housework could indicate some difficulty on the part of respondents in calculating the number of hours spent doing this activity. This question encompasses a more varied range of activities than either the child-care or care-to-seniors question, and respondents may be unsure which activities to include or have difficulty recalling the time spent on them. Also, if respondents had first included the time spent on child-care or senior-care activities in their response to the housework question, they may have had to go back and correct their first response. If this correction was not observed by the person capturing the data from the questionnaire, a multiple response would have been captured.

Edit and Imputation

The process by which non-response and multiple response errors are corrected in the census is termed "edit and imputation."

Editing involves inspecting the captured responses in search of errors such as non-response and erroneous multiple response. As already described, these errors can be the result of respondents answering the questions incorrectly or incompletely, or they can be due to data entry errors generated during the data capture from the questionnaires.

Imputation is the process of inserting alternate or new responses designed to correct the errors detected during editing. There are two broad classes of imputation: deterministic imputation and stochastic imputation. In deterministic imputation, errors are corrected by inferring the appropriate value from answers to other census questions. For example, if there is no response to the question about sex, but the person is described elsewhere as being the son of Person 1 then "male" can be imputed as the correct response for sex.

To explain stochastic imputation, consider the example of an item that is missing or clearly incorrect, which cannot be imputed using deterministic imputation. Suppose a person's captured responses indicate that he/she is employed at the Ottawa Hospital, but the question on occupation has no entry. In principle, stochastic imputation involves randomly searching the already corrected census records for another person who is regarded as being "sufficiently similar in relevant respects" and who does have an entry for occupation. That person's response is then entered into the record where occupation was missing. The person supplying that information is called a "donor." The phrase "donor imputation" is used below to refer to this kind of imputation.

The phrase "sufficiently similar in relevant respects" needs clarification. Again, for simplicity, let us proceed with our example. Since we already know that the person is working at the Ottawa Hospital, we might decide that working at a hospital is a relevant respect and, therefore, only persons so employed would be eligible to become donors. In general, a set of

characteristics or "matching criteria" thought to be related to the missing item is selected, and a search is made for persons who match the record in error on those characteristics. These persons are considered to be donors. The missing information is then imputed from among the donor records.

From time to time, a complete match on all the criteria is not found. In that situation, the best possible match is found within the established limits of the search.[4]

The foregoing remarks were designed to introduce the reader to the main features of imputation. In the next few paragraphs, we describe how imputation was applied to the kinds of errors discussed above.

Imputation of Non-Response

Respondents 15 years and over, who were missing a response for one or more unpaid work questions, were assigned a value through stochastic imputation. The imputation of the unpaid work variables was divided into two parts. Questions on unpaid housework and child care were imputed in a separate process from that dealing with care of seniors. It was felt that, in selecting a donor, characteristics that might determine the number of hours spent on housework or child care, e.g., the presence of children in the household, would be less relevant to a question on the number of hours spent caring for seniors. Separating the imputation process into two parts allowed for the use of different matching criteria for the two sets of variables.

To find a donor to impute missing housework and child-care data, records were first stratified by type of dwelling. Persons living in collective dwellings were further stratified according to the type of collective they lived in. Persons in private dwellings were stratified by sex and age group. Within these dwelling type and sex and age strata, the following variables were used as additional matching criteria in the choice of donor: five-year age groups, marital status, presence of children, number of children, number of hours of paid work and place of work.

The imputation process for the care of seniors variable stratified persons living in collective dwellings according to the type of collective. Persons in private dwellings, however, were stratified by sex and membership in an economic family with a senior member (defined as persons aged 60 and over). Persons in economic families without a senior member were further divided by age into persons under 45 and persons 45 and over. The matching criteria used to select a donor were five-year age groups, marital status, place of work, number of hours of paid work and age group of senior (for persons living with a senior).

As a result of the imputation processes, a donor who fully matched the erroneous record on all matching criteria was found in approximately 92% of cases[5] in the imputation of the housework and child-care variables, and in 98% of cases in the imputation of the care of seniors variable. In both processes, donors could be found for all the records.

Table 1.5 shows the distribution of the unpaid work variables before and after stochastic imputation has taken place. The table shows minimal change in the distributions as a result of the imputation procedures used. These data are for Canada as a whole. It is worthwhile to note that, for these sub-populations, there is minimal change in the distributions resulting from the imputation process.

Resolution of Erroneous Multiple Responses

Multiple response errors for the unpaid work questions were resolved through deterministic imputation. In all cases, the category with the lowest hours marked by the respondent was assigned to the respondent. The lowest category was chosen to avoid assigning a disproportionate number of persons to the highest "hours" category, while still retaining one of the original responses from the questionnaire.

Table 1.6 shows the distributions of the data before and after the deterministic imputation took place. As the number of multiple response errors was extremely small, compared to the total number of responses, their imputation has had a minimal effect on the distribution of the data.

Table. 1.5 Comparison of the Unpaid Work Variables Before and After Imputation of Non-Response, Canada (20% sample data – unweighted)			
	Before imputation	**After imputation of non-response**	**Ratio of distribution before and after imputation**
Unpaid housework:			
Total	100.0	100.0	
None	11.9	12.0	1.01
Less than 5 hours	22.2	22.3	1.00
5-14 hours	29.9	29.9	1.00
15-29 hours	19.2	19.1	0.99
30-59 hours	11.6	11.6	1.00
60 hours or more	5.2	5.2	1.00
Unpaid child care:			
Total	100.0	100.0	
None	60.4	60.9	1.01
Less than 5 hours	9.7	9.6	0.99
5-14 hours	10.3	10.2	0.99
15-29 hours	7.0	6.9	0.99
30-59 hours	5.4	5.4	1.00
60 hours or more	7.2	7.1	0.99
Unpaid care of seniors:			
Total	100.0	100.0	
None	83.0	83.0	1.00
Less than 5 hours	10.9	10.8	0.99
5-9 hours	3.4	3.4	1.00
10 hours or more	2.7	2.7	1.00

Conclusion

This report begins the evaluation of the quality of the estimates of unpaid work collected from the 1996 Census through an examination of the non-response and multiple response rates and subsequent imputation of the data. The results of the examination found that, compared with other census questions, the non-response rate for the question on unpaid housework was relatively low. However, the rates for the questions on unpaid care to seniors, in particular, unpaid child care, were comparatively higher. It is our hypothesis that the higher non-response

rates for the latter questions are more likely attributable to the tendency for some respondents to skip questions they think do not apply to them.

Men had consistently higher non-response rates than women for all the provinces and territories. While this may just be further evidence of the hypothesis stated above, the question is raised as to whether men are less likely to identify their household work with the census questions on unpaid work and, ultimately, underreport the amount of time they spend on these activities.

Evaluation of the erroneous multiple response rates indicates data of acceptable quality for the child-care and care-to-seniors variables. In contrast, the rate for responses concerning unpaid housework was the highest among the set of census variables for which data were available. However, since the absolute level of multiple response is extremely low, the data on unpaid housework should not be regarded as being data of bad quality. Rather, these results may be a warning that this variable deserves special attention in future analyses.

Table 1.6. Comparison of the Unpaid Work Variables Before and After Imputation of Multiple Response
(20% sample data – unweighted)

	Before imputation	After imputation of non-response	Ratio of distribution before and after imputation
Unpaid housework:			
Total	100.0	100.0	
None	11.7	11.9	1.02
Less than 5 hours	22.2	22.2	1.00
5-14 hours	30.0	29.9	1.00
15-29 hours	19.2	19.2	1.00
30-59 hours	11.6	11.6	1.00
60 hours or more	5.3	5.2	0.98
Unpaid child care:			
Total	100.0	100.0	
None	60.5	60.4	1.00
Less than 5 hours	9.7	9.7	1.00
5-14 hours	10.3	10.3	1.00
15-29 hours	6.9	7.0	1.01
30-59 hours	5.4	5.4	1.00
60 hours or more	7.2	7.2	1.00
Unpaid care of seniors:			
Total	100.0	100.0	
None	83.0	83.0	1.00
Less than 5 hours	10.9	10.9	1.00
5-9 hours	3.4	3.4	1.00
10 hours or more	2.7	2.7	1.00

Deterministic imputation to the lowest "hours" category marked by the respondent was used to resolve cases of erroneous multiple response. Stochastic or donor imputation was used to correct non-response. The imputation process had a minimal effect on the resulting distributions of the data for both Canada and the provincial subgroups of the population.

Appendix 1.A: Census Unpaid Work Questions and Guide Instructions

HOUSEHOLD ACTIVITIES Note: Last week refers to the seven days (Sunday to Saturday) before Census Day. In Question 30, where activities overlap, report the same hours in more than one part. 30. Last week, how many hours did this person spend doing the following activities? (a) Doing unpaid housework, yard work or home maintenance for members of this household, or others. Some examples include: preparing meals, doing laundry, household planning, shopping and cutting the grass.	43. 01　　　None 02　　_　　Less than 5 hours 03　　_　　5 to 14 hours 04　　_　　15 to 29 hours 05　　_　　30 to 59 hours 06　　_　　60 hours or more
(b) Looking after one or more of this person's own children, or the children of others, without pay. Some examples include: bathing or playing with young children, driving children to sports activities or helping them with homework, and talking with teens about their problems.	07　　_　　None 08　　_　　Less than 5 hours 09　　_　　5 to 14 hours 10　　_　　15 to 29 hours 11　　_　　30 to 59 hours 12　　_　　60 hours or more
(c) Providing unpaid care or assistance to one or more seniors. Some examples include: providing personal care to a senior family member, visiting seniors, talking with them on the telephone, and helping them with shopping, banking or with taking medication.	13　　_　　None 14　　_　　Less than 5 hours 15　　_　　5 to 9 hours 16　　_　　10 hours or more

Guide Instructions

HOUSEHOLD ACTIVITIES

Question 30 will provide information on how much time people 15 years and older spend at household tasks, on caring for children and in providing care and assistance to elderly persons. This information will provide a better understanding of how these unpaid activities contribute to the well-being of Canadians.

QUESTION 30 – Unpaid Activities

Mark the circle that contains the total number of unpaid hours spent last week doing each of the activities in parts (a) to (c).

Include hours spent doing unpaid activities for:

• members of one's own household;
• other family members outside the household;
• friends or neighbours.

Do not include hours spent:

• working for pay (report paid work in Question 31);
• doing unpaid volunteer work for a non-profit or religious organization, charity or community group.

Overlapping Activities

People often perform more than one unpaid activity at the same time. For example, a person may spend one hour preparing a meal while at the same time looking after his/her children. This person should report one hour of housework in part (a) and one hour of child care in part (b) of Question 30. It does not matter that these activities took place at the same time.

Part (a) – Doing unpaid housework, yard work or home maintenance

No further instructions.

Part (b) – Looking after children without pay

Report hours spent doing activities such as talking or playing with children if, during these activities, this person was responsible for their care.

Part (c) – Providing unpaid care to seniors

Seniors are all persons 65 years of age and over and some individuals close to 65 suffering from age-related infirmities.

PAPER 2: QUALITY OF THE 1996 CENSUS UNPAID WORK DATA IN LIGHT OF COMPARISONS WITH 1996 GSS DATA BASED ON IDENTICAL QUESTIONS

Introduction

This paper evaluates the quality of the results of the 1996 Census questions on unpaid housework, unpaid child care and unpaid care to seniors, by means of comparing data yielded by identical questions asked on the 1996 General Social Survey (GSS). The key question addressed in this evaluation is: What are the quality implications of the differences between the 1996 GSS and the 1996 Census, given that identical questions were used, when we compute similar distributions (e.g., the distribution of respondents over categories of time spent in child-care work) using the two data sources?

This paper is the second in a series of reports on the evaluation of the quality and "usability" of the census questions on unpaid work. The first paper looked at quality of the census data in terms of non-response rates and levels of imputation caused by manifestly inappropriate responses (Swain and Stone, 1998). The next report presents results of a quality assessment based on using the data from the 1992 GSS time-use diaries.

Methodology

The Dissimilarity Index (DI) is the key statistic used to conduct the comparisons presented below. It involves computing a percentage distribution (on a given variable) from the GSS data, repeating the computation for the same variable from the census data, and then gauging the overall discrepancy between the two distributions. The DI is one half the sum of the absolute differences between the apparently comparable distributions drawn from the two surveys. This is a well-known index among statisticians.

The discussion begins by considering the level of the DI for the entire census and GSS samples (representing the population aged 15 or more). With this value in hand, the following text then considers whether it indicates serious quality defects in one or both of the two data sources.

It is possible to raise and answer some standard statistical questions when trying to decide whether a given level of the DI implies "significant" divergence between the two data sources. A test of statistical significance, based at least on bootstrapping techniques that hold the GSS distribution constant, is possible. This would allow one to answer the question as to whether the DI level could easily have arisen by chance, if the GSS distribution is the correct one. We avoid constructing such a test because, in most cases, the census sample size, at least, is so large that non-substantial DI values could appear to be significant. Even though only statistical significance would be at issue, many users of these results would subtly extend the importance of the results to the realm of substantive significance.

Therefore, we use two other approaches to create a perspective from which to assess whether a given DI value should be taken as indicating a serious discrepancy between the census and the GSS. The first approach involves consideration of the following question. Suppose we take the GSS distribution as being correct. At what level of misclassification of responses in the census data would we begin to feel that we are in great danger of being misled by the census data?

The answer to this question is arbitrary (as is the selection of a level of significance in a formal test of significance). However, we note that in the official data release guidelines a coefficient of variation of 15% or less is thought to identify data of sampling variability low enough to be published as reasonably reliable. Using this practice as a cue, only when the DI exceeds 15% should we suggest that one of the two data sources is probably seriously damaged by response errors.

Of course, a DI value of 15% should be considered large in some useful sense. However, as we argue below, it is wrong to conclude quickly that the problem lies entirely on the side of the census data.

The second approach to developing a perspective for interpreting a single value of the DI involves computing DI levels for more common demographic variables (e.g., age or marital status). By selecting variables known to be measured fairly accurately, we can create one basis for deciding whether a given level of DI in the data on unpaid work probably points to serious damage to the quality of data in either of the two sources.

The study of variations among selected population subgroups is a major activity supported by census data. Thus, the paper presents results of computing DI values for several sub-populations. However, the key purpose of looking at these subgroup-level variations is to help indicate populations where the census data seem especially weak and others where they seem to stand up well in comparison with the GSS data. Thus, in the discussion of the subgroup variations, we selectively pinpoint particular populations that stand out in terms of apparent weakness or strength in quality of the census data. There is no effort to review the pattern of variation in DI values over various breakdowns of the overall population. The discussion, therefore, is very limited when compared to the scope of the information provided in the tables of DI values shown below.

The presentation is in three major parts, one for each of the census unpaid work questions. Before showing any data, however, it is necessary to raise some important cautions regarding the alleged superiority of the GSS data. These cautions arise from the major sources of non-comparability in methodology and time reference between the 1996 Census and the 1996 GSS.

Comparability of the Census and the GSS

The 1996 GSS is the only survey to contain the three unpaid work questions as they appeared on the 1996 Census. Thus, it provides a clear opportunity to compare and evaluate the

quality of the census results. Of the two surveys, the GSS is generally believed to be the superior data source for several reasons outlined below.

Users of the data should be cautious in interpreting differences between the GSS and the census as indications of the inferiority of the census data. Although the census and the GSS used identical questions to collect information on unpaid work, there are several differences between the two surveys that can have a direct impact on the results obtained such that the comparability of the two sources can be called into question.

The first major difference is the method of data collection. The GSS is conducted by an interviewer over the telephone, while the census is conducted through self-enumeration. It is well known that this difference alone can affect data where a respondent might change her/his response to a telephoned question if given time to think for several minutes about the correct answer. For example, when asked "what was your income in the last calendar year," you might give one response if you have 15 seconds to reply and an entirely different one if you have time to consult your tax records.

The GSS responses are believed to be more reliable, because the questionnaire is administered under the control of a trained interviewer who is immediately available to help respondents with any difficulties they have in understanding or answering the unpaid work questions. The interviewer can advise respondents as to what activities should be included under each of the unpaid work categories and help them calculate the time spent on these activities.

On the other hand, although census respondents answer the census questionnaire without the assistance of an interviewer, self-enumeration allows them to take time to consider their answers and to consult with other household members. Without an interviewer waiting on the telephone, there is less pressure to come up with an answer quickly. For respondents who have trouble answering the unpaid work questions, a guide with additional information is provided. (It is widely believed that the guide is rarely consulted.) There is also a telephone assistance system in place where a respondent can speak to a census representative directly and receive the same kind of help provided by an interviewer. However, the respondent might not seek this help as often as he/she would if there was an interviewer involved.

A second major difference between the census and the GSS is the reference period for which the unpaid activities are reported. The GSS collects data over a period of a year, whereas the census collects data at one point in time. The GSS was conducted monthly from February to December 1996. Respondents reported their unpaid work activities for the week preceding the survey interview. The census questions on unpaid work reflect only those activities that took place in the week prior to Census Day (May 14).

Thus, seasonal variations in the variety of activities represented, as well as in the lengths of time people tend to spend doing certain activities, are reflected in the GSS data, but not in the census data. While this is certainly an advantage of the GSS data for representing the situation for a whole year, it is a disadvantage for this study where, ideally, data are required

that represent the situation for a narrowly defined reference period that is common for all respondents. Ultimately, the comparability of the census and the GSS estimates is compromised.

Another reason the GSS data are believed to be more accurate than census data is that the GSS did not allow proxy reporting for the three unpaid work questions. The GSS collects data on only one respondent from each household. The selected respondent reported time spent on each of the unpaid work activities for her/himself only. If the selected respondent was not available to complete the interview, the unpaid work questions were not asked. In the census, on the other hand, it is assumed that one household member answers the unpaid work questions—and the other census questions—for all members of the household (proxy reporting).

The comparative impacts of proxy reporting cannot be evaluated for these data sources because the GSS made no attempt to obtain time-use information about all members of the respondents' households. Both surveys should have collected data for all members of the sample households, so the two situations could be compared. Until the GSS collects data for all members of the households sampled, no one knows what would be the comparable level of proxy reporting in the GSS.

Moreover, in the census, the respondent filling out the questionnaire has time to consult other household members as needed. Also, more than one person can be involved in filling out the census questionnaire. This would not be possible in the GSS, as long as it uses telephone interviews to gather data.

In reality, no one has an estimate of the amount of census proxy reporting in which the person making the report failed to do suitable checking with other household members before filling out the form on their behalf.

One aspect in which the GSS cannot be said to be superior to the census is in sample size. With its large sample size, census estimates will be more reliable than the GSS in terms of sampling variability for dozens of significant sub-populations. The GSS sample consisted of approximately 12,000 persons, 15 years of age and over, excluding institutional residents, living in the 10 provinces. The census sample consisted of one in five households in Canada. (The census unpaid work questions were asked of household members aged 15 and over, excluding institutional residents.) Thus, the census sample is much larger than that of the GSS, leading to dozens of sub-populations for which the census has the potential to yield estimates with low sampling variability, while the GSS would have no chance of doing so.

Finally, the treatment of non-response differs significantly between the two surveys, such that the comparability of the census–GSS estimates may be affected. The census imputes all question non-responses, while the GSS imputes only key demographic variables such as age, sex and living arrangements. As a result, almost every variable in the GSS data base has an element of non-response associated with it. For some sub-populations, the level of non-response is high enough that the accuracy of the GSS estimates could be called into question.

At the very least, the GSS non-response rate should be taken into consideration whenever large census–GSS variances are observed. Where the GSS non-response rate is a substantial percentage of the overall census–GSS difference, we have reasons to be sceptical of the assumption that the GSS data are better.

In short, we support the view that the GSS probably has more accurate data for broad aggregate national-level estimates than the census, although, just how much more accurate is a question for which no answer is available due to the differences in survey methodology cited above.

When many sub-populations are being considered, the sources of non-comparability between the two sets of data are so substantial that it is unwise to assume that the GSS has superior data. And variations among sub-populations are critically important in a very large area of social science. Whenever such variations are a major aspect of analysis, the assumption that the GSS provides superior data should be regarded with scepticism.

Moreover, it is to be doubted that the value of the census unpaid work data is primarily in the production of estimates for broad, national-level aggregates, where the advantage probably lies with the GSS. It is arguable that, given what is already known from the GSS data about those aggregates, more estimates for broad national aggregates are substantially less useful and valuable than are new data for sub-populations where the GSS has no hope of yielding any usable estimates.

Global Differences

For all three unpaid work variables, the global DI values fall below the 15% level suggesting a serious census–GSS discrepancy (Table 2.1). The greatest discrepancy is indicated for the data on child care with a DI value of 11%. When compared against the DI values computed for a "comparison set" of demographic variables (Table 2.1), only the DI value for the highest level of schooling is larger at almost 13%. The other variable with a relatively large DI value is household income (11%). At 9%, unpaid housework follows household income in terms of size of census–GSS discrepancy, while the DI value for the unpaid care-to-seniors data (2%) is among the lowest values, comparable with that of marital status.

Thus, based on these global comparisons, it seems that the census unpaid work variables were measured with a level of accuracy within the range established for other variables regularly measured in the census.

As noted above, the DI values pertaining to unpaid housework and unpaid care for seniors are 9% and 2%. Among women, the figures are 11% and 3%, respectively. These DI values are higher than the corresponding ones for men, a result that is inconsistent with the belief that the census data for men are especially weak compared to similar GSS data.

**Table 2.1 Global Dissimilarity Indexes Comparing Census
and GSS Distributions for a Comparison Set of Census Variables**

Dissimilarity Index for Census and GSS	Census	GSS	Difference
Unpaid housework:			
None	11.5	7.1	4.4
Less than 5 hours	22.7	22.9	0.2
5 to 14 hours	30.3	37.8	7.5
15 to 29 hours	19.2	21.1	1.9
30 to 59 hours	11.4	9.4	2
60 hours or more	4.8	1.6	3.1
Not stated*		4	
Dissimilarity Index			9.5
Unpaid child care (households with at least one child less than 15):			
None	18.7	13.2	5.5
Less than 5 hours	12.7	9.4	3.3
5 to 14 hours	20.6	18.1	2.5
15 to 29 hours	16.5	20	3.5
30 to 59 hours	13.5	19.3	5.8
60 hours or more	18	20	2
Not stated*		3.3	
Dissimilarity Index			11.2
Unpaid care of seniors:			
None	83.6	81.1	2.4
Less than 5 hours	10.8	11.5	0.7
5 to 9 hours	3.2	3.7	0.4
10 hours or more	2.4	3.7	1.3
Not stated*		2.8	
Dissimilarity Index			2.4
Age groups:			
Age 15-24	17	17	0
Age 25-44	41.2	41.7	0.5
Age 45-64	27.3	26.9	0.4
Age 65+	14.5	14.5	0
Dissimilarity Index			0.5
Marital status (census estimates based on 100% data):			
Never married	27	25.6	1.4
Married/common law	59.1	61.6	2.5
Separated/divorced	7.7	6.8	0.9
Widowed	6.2	6	0.2
Not stated*		0.4	
Dissimilarity Index			2.5

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Table 2.1 (Continued)

Dissimilarity Index for Census and GSS	Census	GSS	Difference
Place of birth:			
In province of residence	64.4	65.8	1.3
Outside province of residence	14.2	14.4	0.2
United States	1	1.3	0.3
Central and South America	2.3	2	0.3
United Kingdom	2.9	3.3	0.4
Other Europe	7.3	6.9	0.4
Africa	1	0.9	0.1
Asia	6.6	5.2	1.4
Oceania and other	0.2	0.2	0
Not stated*		3.3	
Dissimilarity Index			2.2
Home language:			
English	66	64.9	1.1
French	22.7	23.4	0.7
Other language	9.3	5.4	3.9
English and French	0.4	1.7	1.3
English and other	1.4	3.8	2.4
English, French and other**	0.2	0.9	0.7
Not stated*		3.4	
Dissimilarity Index			5.1
Highest level of schooling:			
University	13.3	15.2	1.9
College diploma	16.4	9.7	6.7
Trades certificate/diploma	10.5	13.7	3.2
Some post-secondary	10.8	15.8	5
High school certificate	14.3	16.8	2.5
Elementary/some high school	34.8	28.9	5.9
Not stated*		3.7	
Dissimilarity Index			12.6
Occupation: (1)			
A. Management	9.4	10.8	1.4
B. Business, finance and administration	19.4	17	2.3
C. Natural and applied sciences	5.1	5.3	0.2
D. Health	5.3	6.4	1.1
E. Social science, education, government and related	7	7	0
F. Art, culture, recreation and sport	2.7	2.9	0.2
G. Sales and service	25.8	25.5	0.3
H. Trades, transportation and equipment operators	13.5	13.4	0.1
I. Primary industry	4.5	3.7	0.8
J. Processing, manufacturing and utilities	7.4	7.9	0.6
Not stated*		3.6	
Dissimilarity Index			3.5

Table 2.1 (Continued)

Dissimilarity Index for Census and GSS	Census	GSS	Difference
Total personal income:			
Without income	7.6	8	0.4
Under $5,000	13.9	10.1	3.9
$ 5,000 - $ 9,999	11.8	10.7	1
$10,000 - $14,999	12.9	11.4	1.5
$15,000 - $19,999	9.2	7.8	1.4
$20,000 - $29,999	15	17.1	2.2
$30,000 - $39,999	11.4	12.6	1.2
$40,000 - $49,999	7.4	8.8	1.5
$50,000 - $59,999	4.6	5.9	1.2
$60,000 - $79,999	3.8	4.6	0.8
$80,000 - $99,999	1.1	1.3	0.2
$100,000 and over	1.3	1.6	0.4
Don't know/not stated*		26.3	
Dissimilarity Index			7.8
Household income:			
No income or loss	0.3	0.5	0.2
Under $10,000	5.7	3.8	1.9
$ 10,000 - $ 19,999	11.1	13.1	2
$ 20,000 - $ 29,999	11.8	14.7	2.9
$ 30,000 - $ 39,999	11.8	14.2	2.4
$ 40,000 - $ 49,999	11.5	14	2.4
$ 50,000 - $ 59,999	10.7	11.7	1
$ 60,000 - $ 79,999	16.5	13	3.4
$ 80,000 - $ 99,999	9.6	7.6	2
$100,000 and over	11.1	7.4	3.6
Don't know/not stated*		33.8	
Dissimilarity Index			11

Notes:

*Not stated values are shown for information purposes only. They are not included in the estimations of the distributions.

**Combines the categories French and other, and English, French and other.

(1) Census universe = employed labour force including absent; GSS universe = persons who worked in week prior to survey excluding absent.

The unusually low value of the DI for unpaid care given to seniors reflects, in part, the small number of possible response categories. Also, these data might be more useful as indicators of the census–GSS divergence, if they are limited to people in the prime ages where care for seniors is likely to be an issue in their lives. However, as Table 2.2 shows, the picture changes little when the data are restricted to respondents aged 45 to 64.

As regards the apparent direction of bias in the census distributions, there is a consistent tendency among all three unpaid work variables for the census distributions to be more heavily weighted at the lower tails of the distribution (the zero-hours category). At the upper

tails, an apparent "overweighting" of the census distributions is seen for housework, and among men only for child-care work.

Table 2.2 Population Aged 15 and Over, Hours of Unpaid Care to Seniors, by Age and Sex

	Total			Age 25-44		
	Census	GSS	Difference	Census	GSS	Difference
	Male					
None	86.4	84.0	2.4	87.0	84.0	3.0
Less than 5 hours	9.6	10.1	0.5	9.4	10.6	1.2
5 to 9 hours	2.4	3.4	1.0	2.2	3.2	1.0
10 or more hours	1.6	2.5	0.9	1.4	2.1	0.7
Not stated		3.0			3.0	
Dissimilarity Index			2.4			3.0
	Age 45-64			**Age 65 and over**		
	Male					
None	82.5	82.0	0.6	86.4	82.1	4.4
Less than 5 hours	12.1	10.2	1.9	7.8	10.7	2.9
5 to 9 hours	3.3	4.6	1.4	2.9	3.4	0.5
10 or more hours	2.1	3.2	1.1	2.9	3.9	1.0
Not stated		3.1			4.4	
Dissimilarity Index			2.4			4.4

	Total			Age 25-44		
	Census	GSS	Difference	Census	GSS	Difference
	Female					
None	80.8	78.4	2.4	80.6	79.6	1.0
Less than 5 hours	12.0	12.9	0.9	12.9	12.2	0.7
5 to 9 hours	4.1	4.0	0.1	3.9	3.8	0.1
10 or more hours	3.1	4.7	1.6	2.6	4.4	1.8
Not stated		2.7			2.1	
Dissimilarity Index			2.5			1.8
	Age 45-64			**Age 65 and over**		
	Female					
None	75.0	72.1	2.9	83.4	79.1	4.2
Less than 5 hours	14.4	16.3	1.9	8.8	11.1	2.4
5 to 9 hours	5.9	5.0	0.9	4.0	4.5	0.5
10 or more hours	4.7	6.6	1.9	3.9	5.2	1.3
Not stated		3.0			4.7	
Dissimilarity Index			3.8			4.2

Note:
Due to small cell sizes in the GSS, data for respondents aged 15 to 24 are not shown.

Population Subgroups with Unusually High Levels of Census–GSS Divergence

Housework
Much above average levels are seen for the youngest and the oldest age groups (15 to 24 and 65+, respectively). Here, we must note the high levels of non-response in the GSS data for the 65+ age group: 7% for men and 10% for women. As well, those who lived alone, or did not work in the week before the survey, or had a non-English home language also had above average DI values.

Table 2.3 shows that, among men, the DI rises above the average only for men living alone. The DI is below average for men and women who have a spouse and a child in their homes. Among women, the DI is above average for those living alone and for lone-parent mothers with a child under 15 in the home. These observations seem inconsistent with the hypothesis that a higher level of proxy reporting in the census was damaging to its quality, compared to that of the GSS.

The DI values for both men and women who had a paid job in the week before the survey are substantially below the average and far below those for persons who did not have such a job. The latter difference is so great as to suggest that those analyses in which one can omit persons without a paid job in the week before the survey could have census data with quality virtually on par with that of the GSS.

Table 2.3 Population in Private Households, Number of Hours of Housework, by Sex and Living Arrangements

Hours of unpaid housework	Census	GSS	Difference	Census	GSS	Difference	Census	GSS	Difference
	Total			**Living alone**			**Spouse only**		
	Male								
None	15.4	10.1	5.3	15.0	7.4	7.6	13.0	11.3	1.7
Less than 5 hours	30.1	29.9	0.2	29.6	36.3	6.7	24.0	25.8	1.8
5 to 14 hours	32.8	40.5	7.7	36.5	43.6	7.1	34.5	40.8	6.3
15 to 29 hours	14.3	14.9	0.6	13.4	10.4	3.0	17.6	16.6	1.0
30 or more hours	7.4	4.6	2.8	5.5	2.3	3.2	10.9	5.5	5.4
Not stated		3.9			5.0			3.8	
Dissimilarity Index			8.3			13.8			8.1
	Spouse with at least 1 child under the age of 15			**Spouse with youngest child 15 and over**					
	Male								
None	7.9	6.4	1.5	13.4	16.4	3.0			
Less than 5 hours	24.6	21.2	3.4	26.3	21.4	4.9			
5 to 14 hours	39.4	45.6	6.2	35.9	38.2	2.3			
15 to 29 hours	19.1	20.0	0.9	16.2	17.9	1.7			
30 or more hours	9.1	6.8	2.3	8.2	6.2	2.0			
Not stated		4.3			3.1				
Dissimilarity Index			7.1			6.9			

Table 2.3 (Continued)

Hours of unpaid housework	Census	GSS	Difference	Census	GSS	Difference	Census	GSS	Difference
	Total			**Spouse only**			**Spouse with at least 1 child under the age of 15**		
	Female								
None	7.7	4.3	3.4	5.4	4.7	0.7	1.8	2.4	0.6
Less than 5 hours	15.7	16.1	0.4	9.9	12.0	2.1	4.7	5.7	1.0
5 to 14 hours	28.1	35.3	7.2	31.1	39.5	8.4	22.5	27.3	4.8
15 to 29 hours	24.0	27.0	3.0	27.6	29.8	2.2	30.4	34.2	3.8
30 to 59 hours	17.0	14.4	2.6	20.3	11.4	8.9	24.9	24.8	0.1
60 or more hours	7.6	2.8	4.8	5.7	2.7	3.0	15.6	5.7	9.9
Not stated		4.2			5.3			3.1	
Dissimilarity Index			10.7			12.6			10.1
	Living alone			**Spouse with youngest child 15 and over**			**Lone parent with youngest child 15 and over**		
	Female								
None	12.9	6.6	6.3	3.6	3.7	0.1	7.0	3.4	3.6
Less than 5 hours	19.8	21.0	1.2	6.3	10.0	3.7	10.5	14.1	3.6
5 to 14 hours	35.5	45.4	9.9	25.5	21.8	3.7	30.5	36.1	5.6
15 to 29 hours	19.8	20.1	0.3	30.9	37.5	6.6	27.3	28.3	1.0
30 or more hours	12.0	6.9	5.1	33.7	27.0	6.7	24.7	18.1	6.6
Not stated		7.4			3.6			4.4	
Dissimilarity Index			11.4			10.4			10.2
	Lone parent with at least 1 child under the age of 15								
	Female								
None	2.6	1.1	1.5						
Less than 5 hours	6.3	8.9	2.6						
5 to 14 hours	26.2	34.2	8.0						
15 to 29 hours	29.2	32.2	3.0						
30 to 59 hours	21.4	18.6	2.8						
60 or more hours	14.3	5.0	9.3						
Not stated		2.5							
Dissimilarity Index			13.6						

Note:
Due to small cell sizes in the GSS, data for male lone parents could not be compared. The categories 30-59 hours and 60 or more hours are collapsed for women living alone, living with a spouse and one child aged 15 and over, and lone parents living with a child aged 15 and over.

This is particularly notable regarding men, since their propensity to have had such a job would be generally very high across the country. This proposition, if correct, would be yet another reason for suggesting that it is quite wrong to allege that the census data for men are especially weak compared to those of the GSS. Also notable are the low DI values for both men and women who have a university education. This suggests that where an analysis can be restricted to university-educated persons with a job in the week before the survey, the quality of the census data is likely to be on a par with that of the GSS.

Child Care

Patterns, broadly similar to those just cited for housework, are seen in the DI data for child care. One notable difference applies to lone-parent mothers, where the census–GSS discrepancy is below average in the case of child care.

The child-care data are limited to persons who had a child aged less than 15 in their homes, and are especially worthy of study for the 25 to 44 age group (Table 2.4). In this age group, the DI for men is 15%, two points above the average. The DI for women is at the average of 13%. For both sexes, the DI level is being generated largely by apparent "overweighting" of the census distributions in the lower section of the scale of hours spent doing child care.

This suggests that the census data are not overstating men's or women's contribution to child-care work. The greater discrepancy for men may have little to do with proxy reporting (if we assume the wife is filling out the questionnaire) since both sexes show marked "overweighting" of the census distributions in the lower section of the scale.

Table 2.4 Population Aged 15 and Over, Hours of Unpaid Child Care,
by Sex and Age Groups
(Households with at least one child less than 15)

	Total			Age 25-44			Age 45 and over		
	Census	GSS	Difference	Census	GSS	Difference	Census	GSS	Difference
					Male				
None	23.1	16.8	6.3	12.0	6.0	6.1	25.5	22.3	3.1
Less than 5 hrs	17.8	14.0	3.8	15.9	10.8	5.0	23.5	17.5	6.0
5 to 14 hours	25.6	24.7	0.9	29.5	27.8	1.7	27.0	24.8	2.2
15 to 29 hours	16.7	25.1	8.4	21.1	30.5	9.4	12.5	22.0	9.5
30 to 59 hours	9.3	13.5	4.2	12.1	17.7	5.6	11.5	13.4	1.9
60 or more hours	7.5	6.0	1.5	9.4	7.2	2.2			
Not stated		3.8			4.3			5.1	
Dissimilarity Index			12.6			15.0			11.4
					Female				
None	14.8	9.9	4.8	6.6	2.6	4.0	22.0	17.2	4.9
Less than 5 hours	8.2	5.3	2.8	5.1	2.2	3.0	13.6	11.6	2.1
5 to 14 hours	16.1	12.2	4.0	16.2	11.2	5.1	24.1	24.6	0.6
15 to 29 hours	16.4	15.4	1.0	18.9	18.7	0.2	16.6	9.1	7.5
30 to 59 hours	17.3	24.5	7.2	20.9	26.6	5.7	23.7	37.6	13.9
60 or more hours	27.2	32.6	5.4	32.2	38.8	6.6			
Not stated		2.8			2.9			4.8	
Dissimilarity Index			12.6			12.3			14.5

Note:
Due to small cell sizes in the GSS, data for respondents aged 15 to 24 are not shown. Data for those aged 45 to 64 and those 65 and over have been collapsed. The categories 30 to 59 hours and 60 hours or more have been collapsed for men and women aged 45 and over.

For both men and women, the subset living with a spouse, has DI values right at the average of 13%. This implies that the 15% value cited above for men is above the average because of men in other living arrangements.

In sum, the DI levels for child care are generally close to the danger zone of 15% or more. However, they are not markedly worse for men than for women where we restrict observations for persons living with a spouse/partner. They are better than the overall average (for child care) in the case of lone-parent mothers. The latter population's 10% DI is well within the range established for census–GSS divergence across a representative selection of census variables.

Senior Care
Patterns, broadly similar to those cited above for housework, are also seen in the DI data for senior care. In particular, higher than average DI values are observed for men living with a spouse only, lone-parent mothers, persons who did not work in the week before the survey or those with a non-English home language. However, the levels of the DI regarding senior care are so low (almost always below 5%, see Table 2.5) that further discussion for this variable seems unwarranted. The data suggest that, with regards to senior care, the census data are on a par with the GSS as far as quality is concerned.

Table 2.5 Population in Private Households, Hours of Unpaid Care to Seniors, by Living Arrangement

	Total			Living alone			Spouse only		
	Census	GSS	Difference	Census	GSS	Difference	Census	GSS	Difference
Male									
None	86.4	84.0	2.4	89.3	85.9	3.4	86.6	81.1	5.5
Less than 5 hours	9.6	10.1	0.5	7.1	8.6	1.5	9.0	11.9	2.9
5 to 9 hours	2.4	3.4	1.0	2.2	2.4	0.3	2.6	3.7	1.1
10 or more hours	1.7	2.5	0.9	1.5	3.1	1.7	1.8	3.3	1.5
Not stated		3.0			3.3			3.0	
Dissimilarity Index			2.4			3.4			5.5

	Spouse with at least 1 child under the age of 15			Spouse with youngest child 15 and over		
	Census	GSS	Difference	Census	GSS	Difference
Male						
None	83.4	83.4	0.0	81.9	81.6	0.2
Less than 5 hours	12.3	10.2	2.2	13.1	13.2	0.1
5 to 9 hours	2.8	4.2	1.4	5.0	5.1	0.1
10 or more hours	1.5	2.3	0.8			
Not stated		3.4			2.6	
Dissimilarity Index			2.2			0.2

Table 2.5 (Continued)

	Total			Living alone			Spouse only		
	Census	**GSS**	**Difference**	**Census**	**GSS**	**Difference**	**Census**	**GSS**	**Difference**
Female									
None	80.9	78.4	2.4	83.8	79.2	4.6	80.9	78.3	2.6
Less than 5 hours	12.0	12.9	0.9	10.0	11.4	1.3	11.1	13.0	1.8
5 to 9 hours	4.1	4.0	0.1	3.9	4.8	0.9	4.4	3.9	0.5
10 or more hours	3.1	4.7	1.6	2.3	4.7	2.4	3.5	4.8	1.3
Not stated		2.7			3.9			3.5	
Dissimilarity Index						4.6			3.1

	Spouse with at least 1 child under the age of 15			Spouse with youngest child 15 and over			Lone parent with at least 1 child under the age of 15		
	Census	**GSS**	**Difference**	**Census**	**GSS**	**Difference**	**Census**	**GSS**	**Difference**
Female									
None	77.8	80.7	2.9	73.6	71.1	2.6	81.0	77.7	3.4
Less than 5 hours	14.9	12.6	2.4	16.1	16.7	0.6	11.7	9.9	1.8
5 to 9 hours	4.5	2.7	1.8	5.9	5.1	0.8	4.3	6.8	2.5
10 or more hours	2.8	4.0	1.2	4.4	7.2	2.8	3.0	5.6	2.6
Not stated		2.6			1.6			1.9	
Dissimilarity Index			4.1			3.4			5.1

Note:
Due to small cell sizes in the GSS, data for male lone parents and female lone parents with a child 15 and over could not be compared.

As we close this discussion and get ready to develop an evaluation using the GSS time-use data (where the strength of the GSS is considered to be transparently pre-eminent), it is important to observe that nothing similar to the census data on senior care is available in the GSS time-use data. There is no way to extract useful estimates of time spent doing senior care from the 1986 or 1992 time-use surveys (GSS). Hence, for this kind of care, there is no contest—the census data are the winners.

To be sure, there are serious limitations in the census senior care data, arising from the fact that the census does not allow one to determine which respondents had senior relatives who might need care. However, by limiting analysis to situations where the respondent has a senior in the home, especially where the senior is reportedly disabled, it becomes possible to make useful applications of the census senior care data that are utterly impossible with the GSS. (For a related discussion see Stone and Silver, 1998a).

Conclusion

In conclusion, only the data for child care show levels of the DI that are close to a danger zone where there are signals that unacceptably weak data may exist. Even the child-care data have DI values within the range of values observable across the spectrum of those census variables whose legitimacy for inclusion in the census is not questioned.

Moreover, if the analysis can be restricted to those who had a job or a university-level education, one has enhanced the quality of the census data subset being used, at least in comparison with using the entire census data set.

Indeed, with the data on housework, that restriction places us in a situation where it is impossible to say whether the census or the GSS has better data quality, as far as the stylized time-expenditure questions are concerned. This perhaps controversial remark applies to all the data on senior care. The situation concerning senior care is especially important because the GSS time-diary data (where the case favouring the GSS is most strongly made) offer no opportunity to provide estimates of time spent caring for seniors.

Finally, contrary to our expectations, there are no indications in this study that the census unpaid work data for men are of weaker quality than those for women.

In short, the quality-based case against the census unpaid work data cannot be made on the basis of what we know about non-response patterns or the prevalence of inappropriate multiple responses (the subject of our first paper). This (second) paper demonstrates that a case can also not be made on the basis of the stylized time-use question, despite the fact that both surveys used identical questions. Thus, the quality-based case against the census unpaid work data will now have to rest 100% on what turns up in our analysis of the 1992 GSS time-diary data. (Though the 1998 GSS time-diary data are a better choice, they are not yet available.) This will be the subject of our next paper.

PAPER 3: QUALITY OF THE 1996 CENSUS UNPAID WORK DATA IN LIGHT OF COMPARISONS WITH 1992 GSS BASED ON DIARY DATA

Introduction

This paper evaluates the quality of the results of the 1996 Census questions on unpaid housework and unpaid child care, by means of comparisons with data yielded by the time-diary data from the 1992 General Social Survey (GSS). This study tests whether certain patterns of difference between diary and stylized data, as described by the literature, are found in reasonably comparable data for selected distributions from the 1992 GSS and the 1996 Census.

Only the census questions on housework and child-care activity are addressed in this paper, as the 1992 GSS diary data are not suitable for an analysis of time spent on care to seniors. The 1998 GSS has attempted to address this defect with special probing concerning care given to seniors.

This is the third and final paper in a series of reports on the evaluation of the quality of the census questions on unpaid work. The first paper looked at the quality of the census data in terms of non-response rates and levels of imputation caused by manifestly inappropriate responses (Swain and Stone, 1998). The second paper examined the quality implications of differences between distributions from the 1996 Census and corresponding distributions from the 1996 GSS, given that both surveys used identical questions (Stone and Swain, 1999). A fourth paper on potential analytical uses of the census data is also available (Stone and Silver, 1998a).

Methodology

Because of the limited comparisons that can actually be made between the diary and stylized data (see below), the hypothesis to be tested in this paper is very simple. Generally, we expect that when time use estimates obtained using the diary method are compared with estimates obtained using stylized questions, the patterns of the distribution for housework should be reasonably similar. In the case of child care, the stylized method should produce much higher estimates than the diary method where only primary child-care time is counted.

Again, because of the basic non-comparability of the GSS diary data and census data, no actual numbers are compared. Rather, patterns in the data are conveyed through a series of charts.

Comparability of the Census and the GSS

Many of the sources of non-comparability between the 1996 GSS and the census outlined in the second paper apply also to the 1992 GSS, namely, the telephone/interviewer method of data collection, differences in reference period, proxy reporting and handling of non-response. (For a full discussion of these differences see Stone and Swain, 1999.) With the introduction of

the time-diary data, however, new sources of non-comparability between the census and the GSS are added to those already discussed.

As mentioned in the second paper, one source of non-comparability between the census and the GSS was the reference period. As was the case with the 1996 GSS, 1992 GSS data were collected over a year, whereas the census data were collected at only one point in time. In addition to this seasonal variability in the data, there is now also the basic difference of the year in which the surveys took place: 1992 versus 1996.

A most important and fundamental difference between the census and 1992 GSS time-diary data is how the information on time spent on unpaid work activities is collected and estimated. As the time diary suggests, respondents are asked to report all activities carried out over a 24-hour period—usually the day before the interview—in a diary fashion. The activities are then coded according to a pre-established set of codes. To arrive at an estimate of the amount of time spent on an activity such as housework, the times reported for individual activities, such as meal preparation, laundry and cleaning, are added together. Thus, it is the researcher who defines which activities constitute unpaid household or caring work.

In contrast, the census used three stylized questions to collect information on the three separate unpaid work activities. The respondent provided an estimate of time spent doing each of the activities for the seven-day period preceding the census. To reduce respondent burden, the census questions used answer categories to record the time spent rather than exact estimates. Thus, it was the respondent who ultimately determined which activities were included under each of the unpaid activity questions. This can result in a wide range of interpretation by respondents, particularly the housework question.

In short, so great is the collection of non-comparabilities between the census and the GSS time-diary data that it is best to adopt, as a working hypothesis, the notion that the two sources are measuring different variables. Each measured variable is useful for a specific class of analytical questions. The different classes or analytical questions may overlap, but they are not equivalent.

Stylized versus Time-Diary Methods of Data Collection

In his review of the literature on diary and stylized methods of data collection, Paillé (1994) found that the accuracy of estimates from the diary method is generally believed to be superior to that from the stylized approach. The diary method uses a shorter recall time (usually the previous 24 hours). Therefore, activities are more easily remembered. Respondents merely report their activities in chronological order to be coded later by the researcher.

On the other hand, because diaries collect information for only one day in each respondent's life, infrequent activities can easily be underestimated. Volunteer work is an activity that often takes place in a few days of each week or each month for a given respondent and, thus,

its prevalence in the population is probably underestimated in diary data (for a related discussion see Paillé, 1994).

The GSS diaries usually collect information on so-called primary activities only. They do not collect information on other activities that occur simultaneously, a most important example of which is child care.

Stylized questions generally use a longer reference period, such as a week or a month, which can lead to recall difficulties for the respondent. The respondent must also decide which activities to include when deciding how much time has been spent on an activity such as housework.[6]

Finally, in comparison with diary data, data from stylized questions may overestimate time spent on activities that often occur simultaneously with other activities. This is because respondents are asked to estimate time spent on each activity separately, so when all time reported in each question is added together, the total time estimated is often larger than the reference period.

However, that property of data based on stylized questions is not a weakness where it is important that multitasking within a specific time interval be considered. In this situation, activities frequently done in multitasking mode may be better measured with stylized questions than with a time-use diary that restricts every moment of time to one and only one primary activity. (This restriction is not intrinsic to time-use diary data, but it is a property of the GSS diaries.)

In this context, there is no overestimation arising from the stylized questions. Analysts simply need to know how to exercise due caution in adding numbers across activities. This is a minor problem because data based on stylized questions are not often used to arrive at estimates of total time spent doing unpaid work.

This issue of measurement of multiple activities within a given time period is of fundamental concern in the estimation of the time spent on child care. Most experts on child-care work believe that total time spent in the care of children cannot be adequately appreciated unless multitasking is taken into account.

Returning to the hypotheses to be tested in this paper then, the literature suggests that estimates of time spent on housework should be roughly similar between the two methods. In the case of time spent on child care, however, the stylized questions should produce larger estimates (higher proportions in the upper tails of the distribution) than the time-diary data.

Housework
The list of activities from the GSS diary data used to estimate time spent on unpaid housework is taken from the Total Work Accounts System (TWAS) data base (Stone and Chicha, 1997). It must be noted that the TWA definition of "unpaid work for self and others" is fairly broad, and it is very unlikely that census respondents would themselves have included

all the activities involved with the "unpaid work for self and others" variable of the TWAS. (For the full definition of "unpaid work for self and others" used in the TWA, see Appendix 3.A.) The figures presented below, therefore, provide only a rough indication of the comparability of the diary and stylized data on unpaid housework.

Looking at the data for women first of all (Figure 3.1), the distributions appear fairly similar except for the two-to-four hour category. However, this pattern could be the result of the differences in the list of activities that could be included as housework as mentioned above.

Turning to the data for men, the distributions from the two sources appear quite similar. The diary data show a higher proportion of men spending 4.3 to 8.5 hours on unpaid housework than the census. Again, this may be the result of differences in the housework definition.

On the other hand, the much higher proportion of men in the census with zero hours of housework than in the GSS may lead us to suspect that the census data for men are underreported. While there may be several reasons for this, the most often cited is proxy reporting. This would assume that most proxy reporting is done by women and that women consistently underestimate the amount of housework performed by their spouses. But men, themselves, may underestimate time spent on household work, either because they think the census question does not apply to them, or because they think the activity or time spent on it is too insignificant to count. For example, taking out the garbage or changing a light bulb takes little time and may be ignored or even forgotten over the course of a week.

Child Care
Figure 3.2 compares time spent caring for children among respondents with a child under the age of 15 in the home. Here we find our initial hypothesis clearly supported. For both men and women, the stylized question in the census has resulted in higher estimates of time spent on child care compared to the GSS diary data.

Figure 3.1. Distributions of Population by Categories of Hours Spent Doing Housework (1996 Census) and Hours Spent Doing Unpaid Work for Self and Household (1992 TWAS)[1]
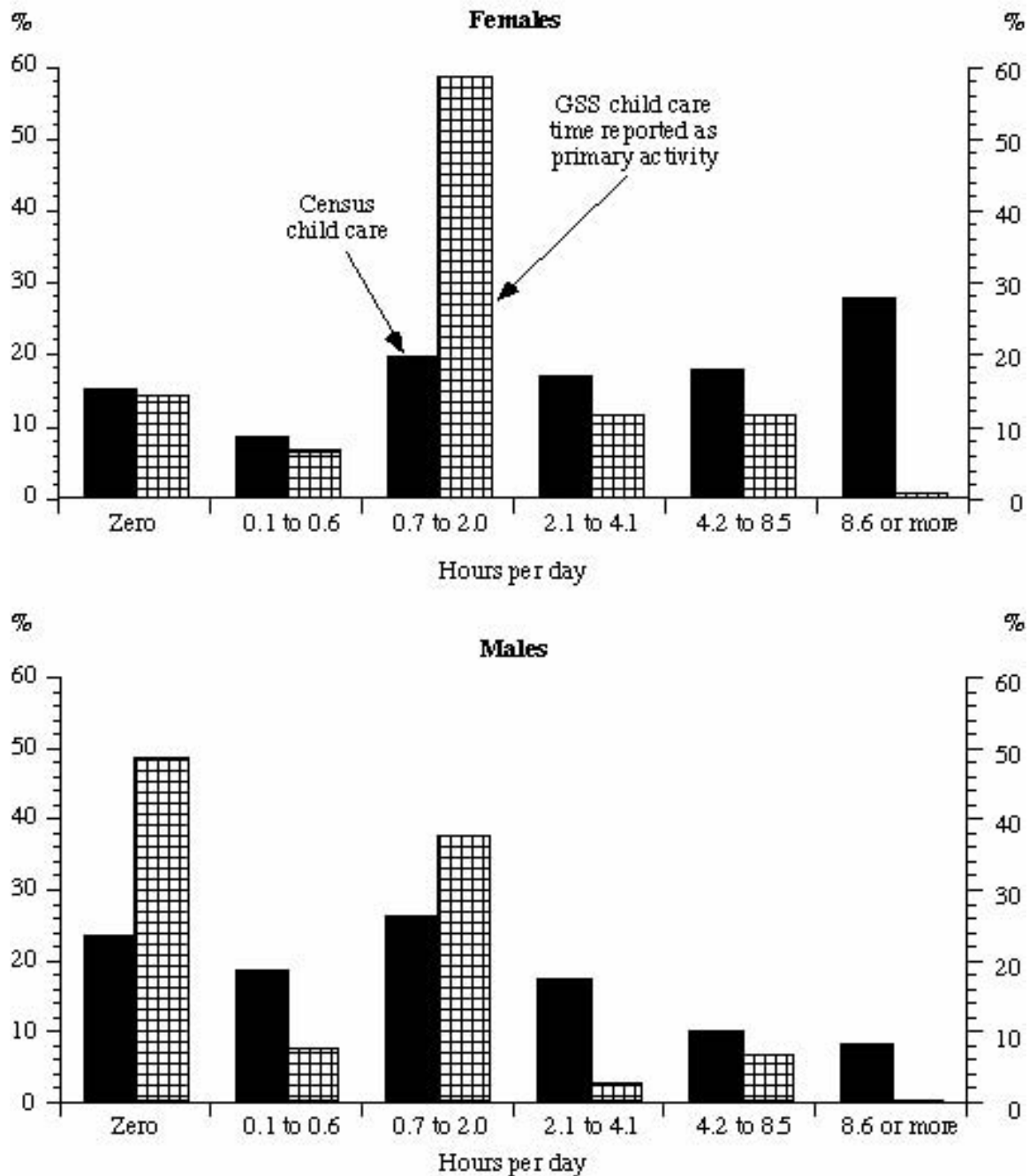(Population aged 15 or more)
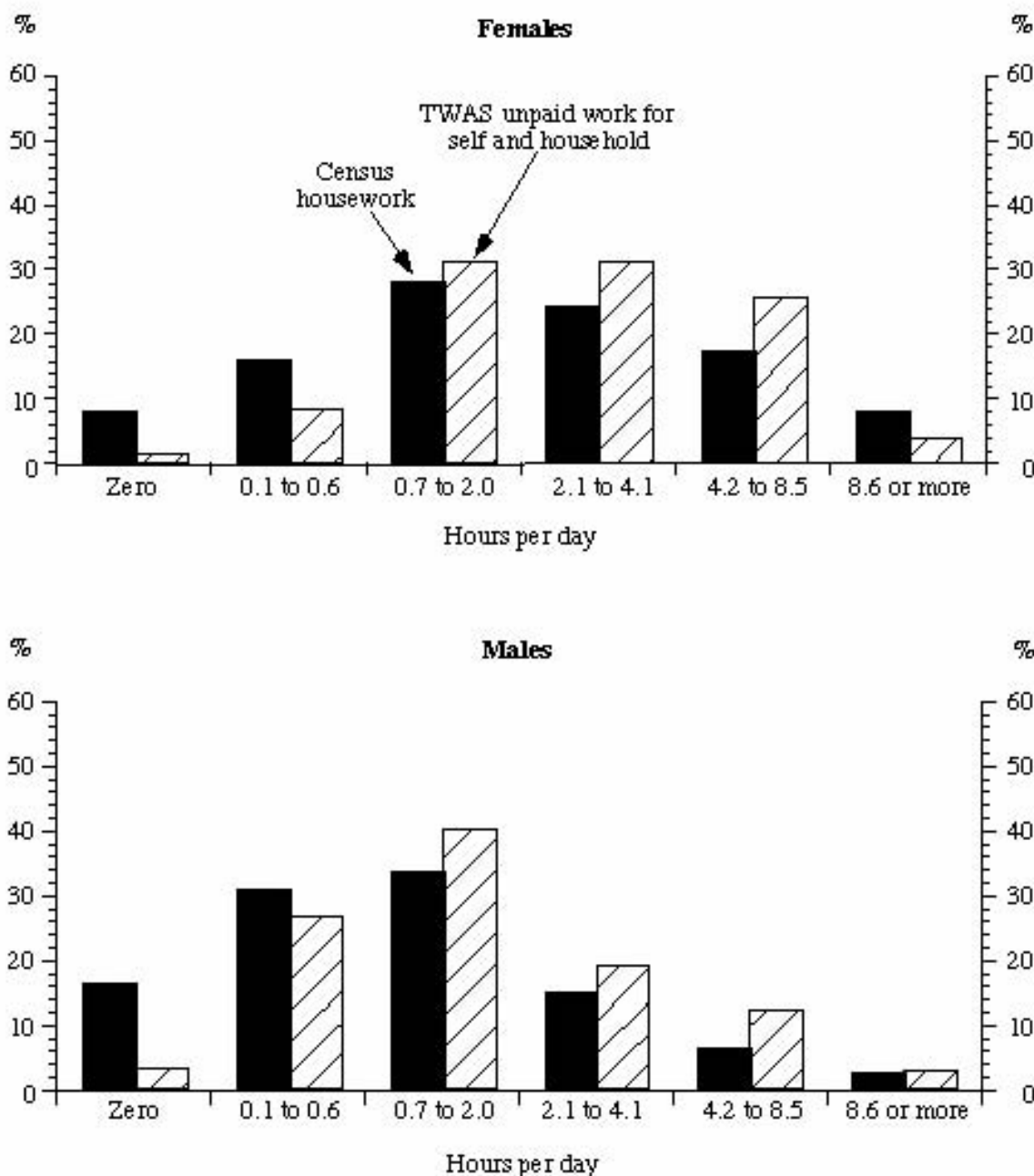
Note:
[1] Total Work Accounts System, based on the 1992 General Social Survey.
Source:
Statistics Canada, 1996 Census and the Total Work Accounts System (based on the General Social Survey).

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Figure 3.2. Distributions of Population According to Categories of Hours Spent Doing Unpaid Child Care Work, by Sex, 1996 Census and 1992 General Social Survey
(Population aged 15 or more with a child under the age of 15 in the home)

Source:
Statistics Canada, 1996 Census and the 1992 General Social Survey.

Figure 3.3. Distributions of Population According to Categories of Hours Spent Doing Unpaid Child Care Work, by Sex, 1996 Census and 1992 General Social Survey
(Population aged 15 or more with a child under the age of 6 in the home)
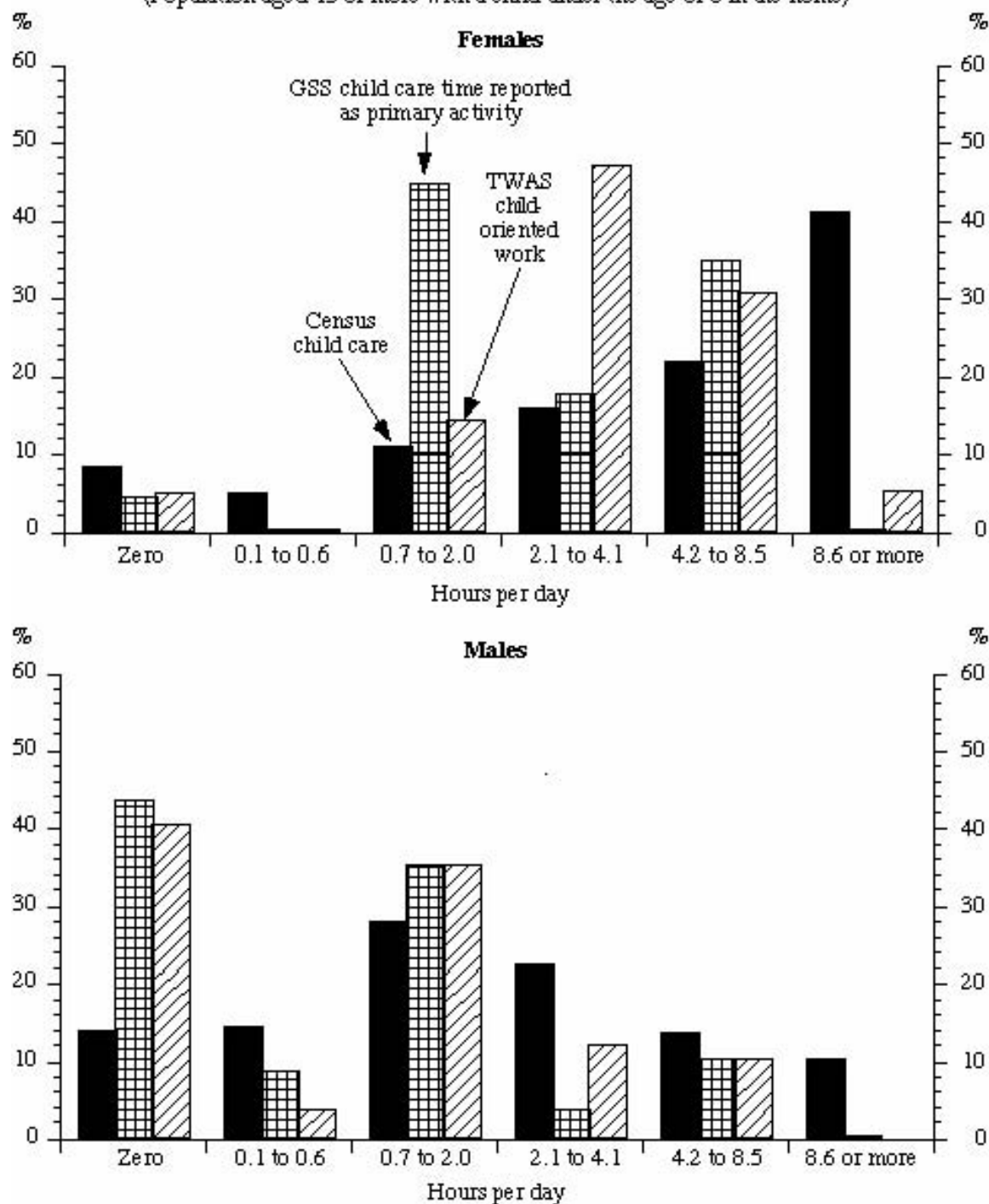
Source:
Statistics Canada, 1996 Census, 1992 General Social Survey and the Total Work Accounts System (based on the General Social Survey).

Looking at the distributions for women, Figure 3.2 shows the GSS respondents to be heavily concentrated in the 0.7 to 2.0 hours category. Basically, the GSS data are saying that only about 20% of these women spend more than two hours per day in child-care work. While it is possible that children over five do not require more than two hours of care, where the mother's attention is 100% focussed on the child, this pattern only makes sense if we are trying to measure child care as the primary activity. But as we have argued, to have a true measure of time spent on child care, secondary activity or multitasking must also be considered. Hence, despite the weakness in the census child-care data observed in our second paper, the census distribution is probably more useful to the analysis of child-care behaviour than that obtained from the GSS diary data.

Figure 3.3 lends some support to this criticism of the GSS diary data. Here we focus on households with at least one child less than six years old. Hence, we would expect the time invested in child care would be heaviest. In addition to the census and GSS child-care variables, the TWA "child-oriented work" variable is also included. The TWA variable expands the GSS definition of child care to form a new variable called "child-oriented work," by including several additional activities such as housework or shopping if a child was also present during the activity (see definition in Appendix 3.A).

By expanding the definition in this manner, the GSS distribution shifts to the right, suggesting more caring work taking place than indicated by the data based on primary activity only. Still, even the distribution using the TWA definition falls well below that obtained from the census, particularly in the upper category, 8.6 hours or more. While it may seem that the census data are overestimates, it should be noted that in our second study it was found that the proportion of women in the census reporting 60 or more hours of child care was consistently below that observed using the 1996 GSS stylized question.

As mentioned above, the data for men also found that the census stylized question resulted in a higher estimate of time spent on child care by men than shown by the diary data.

Of particular note is the large difference between the census and the GSS in the proportion of men reporting zero hours of child care. The proportion of men in the GSS is almost double that of men in the census for this category. This could be a result of the focus on child care as the primary activity in the diary data.

Conclusion

To conclude, we find that general statements about whether the time-diary data are overall more accurate than the stylized-question data cannot be applied in this census data evaluation.

Because the census measures only three specific aspects of unpaid work, total or overall unpaid work numbers cannot be computed using census data. Rather, time spent on unpaid housework, unpaid child care and unpaid care to seniors must be studied as individual non-additive sets of activities.

Our hypothesis in this paper was that a comparison of time-diary and stylized data would show similar patterns of distribution for housework, but that the stylized questions would produce much higher estimates of child care than the diary data. The data presented in this paper have supported this hypothesis. Even the patterns for housework, although based on very divergent definitions according to the TWA and what we might expect in the census, did not show the census data to be off base when compared with the diary data.

In our analysis of the child-care data, we found that the diary data do not capture the whole story as we see it. The concept of multitasking is fundamental to the understanding of time spent caring for children. Thus, we find the census data are better than the time diary data for measuring this activity.

Finally, with respect to unpaid care for seniors, there is no possibility of reasonable analysis of this activity using time-diary data.

Appendix 3.A: Operational Definitions of Destinations of Work of Economic Value

"The following is a set of operational definitions that are strictly linked to the properties and limitations of the 1992 GSS database. The definitions often represent an effort to impute specific beneficiaries to work activities on the basis of the nature of the activity and the presence of particular persons during the conduct of the activity.

"This imputation was needed because the GSS questionnaire did not ask respondents to identify the perceived beneficiaries of their work activities. This gap is a major limitation of the GSS database for the purposes of the TWAS.

. . .

"Plain language cannot render some of the following definitions clearly. This is because of complex Boolean logic structures built into some of the definitions. Hence the following set of definitions in plain language are less precise than the corresponding computer program code.

. . .

"Destination 6: Child – . . . doing domestic work, or routine shopping, or Care of Children, and in contact with the child during that particular work.

. . .

"Destination 9: Self and other members of the household (if any) – . . . doing either of Meal Preparation, Meal Clean-Up, Routine Shopping, Washing, Dressing, Packing, Adult Medical Care (at home), and reportedly alone during that particular work (imputation of work output of economic value – service you would have to buy if you could not do it for yourself – to self)."

Source:
Stone and Chicha (1996).

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GLOSSARY

Census family
Refers to a now-married or common-law couple (with or without never-married sons and/or daughters of either or both spouses) or a lone parent of any marital status, with at least one never-married son or daughter living in the same dwelling.

Children
Refers to the never-married sons and/or daughters of now-married or common-law couples and lone parents.

Collective dwelling
Refers to a dwelling of a commercial, institutional or communal nature. Included are lodging or rooming houses, hotels, motels, tourist homes, nursing homes, hospitals, staff residences, communal quarters (military camps), work camps, jails, missions, group homes and so on.

Dwelling
Refers to a set of living quarters in which a person or a group of persons reside or could reside.

Economic family
Refers to a group of two or more persons who live in the same dwelling and are related to each other by blood, marriage, common law or adoption.

Presence of children
Classifies persons 15 years of age and over living in census families into those with no children at home and those with children at home. Those persons with children at home are further classified on the basis of the age groups of all their children.

Private dwelling
Refers to a separate set of living quarters with a private entrance either from outside or from a common hall, lobby, vestibule or stairway inside the building.

ENDNOTES

[1] It is now generally recognized among analysts of the data that, with regard to child caring work at least, key 1996 Census answers categories (see Appendix A) are much too broad, and will need to be refined if such data are collected in future censuses.

[2] The phrase "2B questionnaire" refers to the questionnaire that had the largest number of questions and which was designed to be completed by only 20% of all census respondents. While the 2B questionnaire was the main instrument used to collect census information, the "2D canvasser questionnaire" was used in remote and northern areas. This questionnaire differed from the 2B in that some of the examples for the unpaid work questions were changed to make them more relevant to living conditions in the north. As well, this questionnaire was completed by an interviewer, whereas the 2B questionnaire is completed by the respondent. Less than 2% of households in Canada received a 2D questionnaire.

[3] As noted earlier, the 2B questionnaire is distributed to a sample of one in five households in Canada. The respondents in this sample are weighted to provide estimates for the entire Canadian population. Unweighted rates provide estimates only for those respondents who actually received the 2B questionnaire.

[4] In order to contain the time and cost of searching for a donor, the respondent records are normally divided into strata which are themselves broadly defined matching criteria, for example, females aged 25 to 44. Both the error records and their potential donors must come from the same strata; a donor cannot come from a different stratum than the record in error. In addition to the search limitations imposed by the strata, a physical limitation exists as the census data base is divided into five smaller bases for processing purposes. The five bases are East, Quebec, Ontario, West and Overseas Households. Therefore, as a minimum, the error record and donor record will match on the broad criteria defined for the strata and the geographic location.

[5] These figures exclude the results for the overseas households. This is a small data base made up of a diverse range of respondents in diplomatic and military situations and includes persons working on vessels. Consequently, the match rate for perfect donors for these persons is lower at 73% for the housework and child care variables and 90% for the care to seniors variable. There were, however, no records for which a donor could not be found. The potential for the overseas records to affect the results of almost all analytical uses of the data is minimal.

[6] The fact the one source uses a fixed set of activities to mean "housework" and another uses a variable set probably means the estimates from these sources are intrinsically non-comparable.