

A Field Test of a Multiple Diary Procedure for the Consumer Expenditure Survey

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Executive Summary

The purpose of the Consumer Expenditure Diary Survey (CEDS) is to obtain data on small, frequently occurring expenditures that would be very difficult for respondents to recall and report in the quarterly interview. Each consumer unit keeps a detailed record of expenses in the diary for two 1-week reporting periods. Usually one person assumes responsibility for collecting and recording expenditures from all other CU members. The Bureau of Labor Statistics (BLS) is interested in testing the feasibility of distributing diaries to every member of the consumer unit (CU) who is at least 14 years old. One person in each CU would be designated as the main shopper and be responsible for recording CU expenses. The other diarykeepers would report their own expenses. This study had two goals:

1. Assess how a multiple diary procedure works in a field setting
2. Compare two different procedures for picking up the diaries from the CU.

To address these goals, a field survey was conducted that asked CUs to keep a diary for a one-week period. All persons in each CU, age 14 and older, were asked to record their expenses in their own diary. For half of the CUs, the field interviewer asked one person to collect the diaries at the end of the week. The field interviewer collected the diaries and interviewed this person. For the other half of the CUs, the field interviewer collected the diary and interviewed each person in the CU.

Method

Housing units in Baltimore and a close suburb were listed by an enumerator. A sample of 243 housing units were drawn from this listing for the study. Interviewers contacted each of the 243 units and screened them for eligibility. A household was eligible if it had at least two persons at least 14 years old living in the same CU. CUs that agreed to participate in the study and returned at least one diary were given a \$20 incentive.

In addition to distributing the diaries, several different interviews were conducted with eligible household members. These instruments resembled parts of the CEDS interview and included:

- CU Introduction
- CU Characteristic Questionnaire (HHCQ)
- Mid-week call script
- Work and Income Questionnaire, Part A
- Work and Income Questionnaire, Part B
- Closing Interview for the Main Shopper (or Other Eligible Member)
- Closing Interview for Other Members
- In-depth Interview Protocol

When initially contacting the household, the interviewer determined the eligibility of the household. If it was eligible, a main shopper was selected to keep the household expenses and distribute diaries to the other household members at least 14 years old. Households were assigned to one of two experimental conditions: 1) main shopper collected the diaries and returned the diaries to the interviewer and 2) the interviewer collected the diaries from each respondent.

Results

The field period was between February 14, 2005 – May 13, 2005. The response rate for the study was 40% (household level). A total of 47 CUs agreed to have diary placed. Of these 47, 34 CUs returned at least one diary. Respondents that did not participate expressed concern about the burden related to the survey request and the amount of time it would take. Part of the reluctance to participate may have been due to the use of multiple diaries. The distribution of multiple diaries contributes to the perception of burden respondents get when first approached to do the study.

For CUs that did respond, the reporting process involved significant communication between CU members. In a number of CUs, the task was viewed as a group activity, where respondents either completed the task together or would consult with each other. A number of respondents also raised specific questions about the diary with the main shopper. Despite this general trend in communication among CU members, the main shopper did not commonly provide explicit instructions about how to use the diary. They seemed to primarily rely on the diary's instructions to provide respondent's guidance on what to do.

There were very few issues related to respondents recording the same expenses in the different diaries. When asked about sharing expenses (e.g., CU bills; common shopping trips), respondents reported very few instances when it was unclear who would record the particular expense. On the whole, respondents adapted the rule provided in the instructions that the person that paid for the item should record the expense.

Significant expenditures were reported by respondents who would normally not keep their own diary under the current CEDS one-diary procedure. The expenditures in the small diaries were disproportionately in the "Food and Drinks Away From Home" section. The largest expenditures were reported in the fourth section of the diary (All Other Products and Services) in the form of bills or large purchases. Expenses reported by younger respondents (14-29) made up 8% of the total reported by all persons in the survey. These results are consistent with the idea that multiple diaries would add to the reporting of expenses that are not known to the main shopper.

The quality of the data entered on the small diary was comparable to that entered on the large diary. All of the fields were consistently filled, including the day the expense was made. Respondents to the small diary also used the instructions in the same way as users of the large diary. They generally skimmed the instructions at the front and relied heavily on the examples placed on the entry pages. Respondents did not generally use the examples placed in the back of the small diary or the note page on the back cover.

The study did not find any significant differences between to the two experimental procedures. Response rates were approximately the same regardless of whether the interviewer

picked up from the main shopper or from each eligible respondent. The level of effort needed to pick up the diaries was the same across the two conditions. Interviewers generally made a single appointment to pick up the diaries. For Condition 2, where the diaries were being picked up from each eligible respondent, the appointments were made for a time when all of the household members would be present.

There did not seem to be a big concern among household members with respect turning in the diary to the main shopper. The small number of Condition 2 respondents that were debriefed in the close-out interview did not express any concern with using a procedure that turned in their diary to the main shopper. Similarly, the respondents to the in-depth interviews were not concerned with the confidentiality of their responses.

Recommended Next Steps

This study has found both advantages and disadvantages of a multiple diary procedure for the CEDS. The possible advantages relate to the increased coverage it could give to the expenses by all household members. The possible disadvantages are the effects the procedure might have on the overall response rate. It is recommended that for the next phase of the research, a larger test be conducted that directly compared the current single diary procedure with a multiple diary procedure. This would permit direct comparisons of the two procedures across several different dimensions, including the potential for non-response bias and the extent to which expenditures are covered with each methodology.

The multiple diary procedure to be implemented would be very similar to that used in the present survey. It is recommended that the procedure that picks up all diaries from the main shopper be used. This recommendation is made because of the time constraints related to picking up the diary in a week and the additional costs related to picking up the diaries from each respondent

There are no recommendations related to changing the format of the small diary. It worked effectively among the persons that filled it in. However, the initial package distributed to the main shopper should be re-designed to minimize the perception of respondent burden. This package should enable the interviewer to insert diaries into a single container that is handed to the respondent.

Modification to the multiple diary procedure should consider methods that can increase the response by both households and individuals. One set of modifications would be to give the main shopper the option of keeping the small diary him/herself for any respondent that they believe will not be willing to keep a record of their expenses. A second set of modifications should be made to arm the interviewers with explicit refusal avoidance tools at both the initial placement stage, as well as when the diaries are picked up (O'Brien, 2005).

The evaluation of the next phase would need to assess the tradeoffs in data quality that result from the two procedures. For example, a single diary procedure may result in a higher overall response rate, getting responses from a higher percentage of households. The multiple diary procedure should increase the reporting of expenditures of certain types (e.g., food away from home; clothing). The question for the next test is whether added non-response is worth the additional coverage of expenditures. The answer to this question will depend on which expenses are being covered and which types of respondents are being left out as a result of the higher survey non-response.

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1. Introduction

The Bureau of Labor Statistics (BLS) reports detailed information on the buying habits of American families. Since 1980, BLS has collected these data through two separate surveys: the Consumer Expenditure Quarterly Survey and the Consumer Expenditure Diary Survey (CEDS). The purpose of the CEDS is to obtain data on small, frequently occurring expenditures that would be very difficult for respondents to recall and report in the quarterly interview. Examples are out-of-pocket costs for food (both at and away from home), housekeeping supplies, personal care products, and entertainment such as going to the movies. The unit of analysis for the CEDS is the “consumer unit,” defined as: a) a collection of household members related by blood, marriage, or other legal arrangement; b) an individual living alone, or someone living with others yet who is financially independent; or c) two or more individuals living together and pooling their incomes to make joint decisions regarding expenditures. Although the CEDS is designed to capture expenses that are quickly forgotten, it collects information on all expenses incurred by the consumer unit over the reporting period, except for business and overnight travel expenses.

Each consumer unit keeps a detailed record of expenses in the diary for two 1-week reporting periods. The diary asks respondents to classify their expenditures into one of four major categories. Census field representatives (interviewers) generally explain and leave the diary with a single respondent in the CU. Usually this person assumes responsibility for collecting and recording expenditures from all other CU members. But it’s known that some under-reporting occurs, presumably because the key respondent cannot be knowledgeable of every single purchase made by other CU members and some of these members may forget (or may lack the motivation) to inform the respondent.

BLS is interested in testing the feasibility of distributing diaries to every member of the consumer unit who is at least 14 years old. One person in each CU would be designated as the main shopper and be responsible for recording CU expenses. The other diarykeepers would report their own expenses. A number of other countries (e.g., France and the United Kingdom) use multiple diaries to collect consumer expenditure data and still others have considered doing so (Westat, 2004a).

The design being considered by BLS would distribute the diary that is now being used on the CED to the person who is considered to be the main shopper. A smaller diary would

be distributed to all other members of the CU who were at least 14 years old. A design for the smaller diary was created based on key elements of the diary that is now in use. As part of this design process, a series of 23 cognitive interviews was conducted with CU members (age 14 and older) in nine CUs (Westat, 2004b).

The purpose of this report is to describe the results of the second phase of this research which had two goals:

1. Assess how a multiple diary procedure works in a field setting
2. Compare two different procedures for picking up the diaries from the CU

To address these goals, a small field survey was conducted that asked CUs to keep a diary for a one-week period. All persons in each CU, age 14 and older, were asked to record their expenses in their own diary. For half of the CUs, the field interviewer asked one person to collect the diaries at the end of the week. The field interviewer collected the diaries and interviewed this person. For the other half of the CUs, the field interviewer collected the diary and interviewed each person in the CU.

The survey was used to assess how the multiple diary procedure worked with respondents that were recruited in the field. While the cognitive interviews provided some sense of how the procedures would work and how the diaries would be used, the respondents had volunteered for the task. A primary goal of the survey was to see how the procedures worked with respondents who were recruited by a field interviewer and would not be as highly motivated to complete the survey tasks. The survey was also used to compare two different methods related to how the diaries would be picked up. One method has the main shopper collect all the diaries from each CU member and turns them over to the interviewer. The second method has the interviewer collect each diary from each CU member. The second method was considered for two reasons. First it might improve the response rate by keeping the collection task in the hands of the interviewer. Relying on the main shopper to collect the other diaries may result in fewer diaries collected. If an interviewer collects all the diaries, the interviewer can make follow-up calls to collect the data. If necessary, they can also conduct recall interviews for those that did not fill it out. Second, this methodology does not require CU members to turn in their diaries to the main shopper. This preserves some of the confidentiality of the data and may increase the reporting expenses that may not otherwise get reported to main shopper.

In the remainder of this report, the methods and results of this survey are described in more detail. In section 2, the methods used for the survey are described. Section 3 describes the results and the final section discusses recommendations for the next steps in designing a multiple diary survey.

2. Methods and Materials

This section describes the sample, questionnaire interviewer training and data collection activities for the survey.

2.1 Sample

Three different areas in Baltimore City and three areas outside the city but within Baltimore County were selected for sampling. These neighborhoods were selected because they seemed relatively “safe;” appeared to include low-, middle- and high-income residents as well as families with young children and those with teenagers; and were in relatively close proximity to the interviewers’ residences, thus keeping field expenses to a minimum. Within these areas, 1,126 housing unit (HUs) were listed by an experienced lister. The listing excluded apartment buildings, housing units in gated communities and dormitories.

An initial sample of 162 HUs was selected from the three Baltimore City areas, as well as two of the Baltimore County areas (Towson and Dundalk). This yielded a workload of approximately 40 cases per field interviewer. After drawing the sample, we randomly assigned each CU to either Condition 1 (diaries picked up from one person in the CU) or Condition 2 (diaries picked up from each diary-keeper in the CU). Twenty percent of the cases (32) were assigned to the in-depth interview condition (Across all the sampled HUs, about one in six were chosen for an in-depth interview.) As described later, CUs selected for the in-depth interview were asked if they would be willing to participate in an in-depth interview that would take place after the diaries were picked up.

The original sample was supplemented in two ways. First, on March 1, 2005 an additional sample of 20 cases was drawn from Reisterstown, which had been included in the original listings. Second, we listed 492 housing units in Timonium, Maryland in late March and drew 61 cases from that listing. This supplemental sample was drawn for two reasons. First, the response rate was not as high as anticipated and a larger sample size was needed to get more

completed interviews. Second, the initial sample projections did not consider the relatively large proportion of CUs that had only one adult in them.

The total sample size was 243 housing units.

To participate in the field test, the consumer unit had to consist of at least two eligible members (except in Timonium, where at least three members needed to be eligible). Eligible members must usually live in the CU and be least 14 years old.

CUs that agreed to participate in the study and completed at least one diary were given a \$20 incentive.

2.2 Questionnaire Development and Administration

A paper interview instrument was created to administer when placing the diaries, as well as when picking them up. These instruments closely resembled the original paper CEDS interview form. The interview consisted of:

- Household Introduction
- Household Characteristic Questionnaire (HHCQ)
- Mid-week call script
- Work and Income Questionnaire, Part A
- Work and Income Questionnaire, Part B
- Closing Interview for the Main Shopper (or Other Eligible Member)
- Closing Interview for Other Members
- In-depth Interview Protocol

At the first contact, interviewers administered the Household Introduction (Attachment A). As the name implies, interviewers used this questionnaire to introduce the Household member to the study determine, if there was more than one CU, ask for the main shopper, read the informed consent statement to the main shopper (or other eligible member), find out if there was more than one eligible person in the CU. Interviewers were instructed to have the main shopper or other eligible member distribute the diaries. If interviewers were unable to contact the main shopper

after two contacts with the CU, they were instructed to ask another eligible member of the CU to distribute the diaries and answer the questionnaires. The other eligible member had to be at least 18 years old and have some knowledge of the CU's shopping habits and financial circumstances. For this field test, it was possible to be able to identify and place diaries with the main shopper in all CUs that agreed to participate in the study.

Once the main shopper agreed to participate, the interviewer administered the HHCQ. The HHCQ consisted of two parts: the roster (Attachment B), which enumerated everyone in the CU, and a section (Attachment C) that collected additional characteristics about the CU. Answers to questions in the HHCQ helped determine the number of CU's in the unit and confirm the number of eligible diary keepers in the CU. None of the CUs where an HHCQ was completed had more than one CU.

Immediately after administering the HHCQ, interviewers placed the requisite number of diaries in the CU. The respondent was instructed that diary keepers should record their expenses for one week, starting the day after the diaries were dropped off. Interviewers reviewed all diary instruction pages with the main shopper. Cover letters attached to each diary (and tailored to the type of diary and type of respondent) also contained instructions for keeping the diaries. CUs in Condition 2 received envelopes for other CU members to seal their diaries as a means of protecting their privacy.

Mid-way through the reporting week, the interviewer called the CU. (The script appears in Attachment D.) Interviewers were instructed to talk to each diary keeper (regardless of what Condition the CU was in). The purpose of the mid-week call was to answer any questions the respondents may have had about keeping the diary, and to make an appointment for picking up the diaries. For CUs in Condition 2, interviewers were supposed to schedule the pick-up time with each individual diary keeper. If the CU was selected for an in-depth interview, the interviewer also asked the main shopper and other participating CU members if they would be willing to participate.

When the interviewers picked up the diaries, they administered the Work & Income Questionnaire, Parts A and B (Attachments E and F) to the main shopper. One Part A questionnaire was generated about each diary keeper. The questions in Part A were asked of the main shopper about him/herself and about each of the other diary keepers. One Part B questionnaire was administered to the main shopper for the entire CU. The Work and Income

Questionnaires contained questions about the kind of jobs held by each diary keeper, their personal income and the income of the entire CU.

If the CU was not selected for an in-depth interview, the interviewer also administered the Closing Interview after finishing the Work and Income Questionnaires. For CUs in Condition 1, the Closing Interview was administered to the main shopper only. For Condition 2, a separate Closing Interview was administered to each diary keeper in the CU. Similar to the CEDS, the Closing Interviews (Attachments G and H) reviewed what was entered in the diary and asked the respondent to try to remember any expenses that were inadvertently omitted from the diary. Additionally, diary keepers were asked about their experiences with filling out the diary, with the multiple diary procedure and, for the main shopper, about distributing the diaries to other CU members.

As discussed above, one in six CUs was selected to participate in an in-depth interview with a senior researcher. For those CUs that agreed to participate in an in-depth interview, the field interviewer conducted only the Work and Income Questionnaires with the main shopper when picking up the diaries. A short while after the diaries were picked up, a senior researcher would contact the CU and make an appointment to conduct a slightly longer in-person interview with the participating CU members. These individuals would each receive a additional \$25 incentive for participating.

2.3 Interviewer Training

Four interviewers were trained on February 7th, 8th, and 9th, 2005 at a hotel conference room in Towson, MD. All four interviewers were experienced Westat field staff and all four completed the training.

The training introduced the staff to the CEDS and to the purpose of this field test. Lectures covered the procedures for contacting CUs, administering the questionnaires, placing and picking up the diaries, and completing administrative tasks. Interviewers were also given ample opportunity, via interactive exercises and role plays, to practice administering the various questionnaires. The training agenda appears in Attachment I.

2.4 Data Collection

On February 14, 2005 an advance letter was sent to 162 CUs in the first sample release (Attachment J). The letter, printed on BLS letterhead and sent in a BLS envelope, was addressed “To the CU at ADDRESS” and was signed by a BLS representative. Interviewers began contacting CUs on February 17, 2005. (The start of data collection was delayed somewhat to ensure that interviewers had signed the proper confidentiality forms.) Early in the field period one interviewer resigned (before touching any of her cases). The cases assigned to this interviewer were redistributed to the other three field staff.

Throughout the field period, interviewers had a weekly phone call with the field supervisor to report on the progress of individual cases and to resolve any problems they encountered. During this call, the field supervisor also administered a short questionnaire to the interviewer about each CU in which diaries were placed (Attachment K). The purpose of this questionnaire was to collect information about the multi-diary procedures.

As noted above, the project experienced difficulties with respect to obtaining cooperation from CUs, as well as finding CU with more than two eligible members. The latter was important for purposes of seeing how the multiple diary procedure would work in relatively large units. As a result, the original field period of eight weeks was extended twice, to May 4, 2005 and then to May 13, 2005. As mentioned above, we also released two additional samples. Advance letters were sent to the second 20 housing units in Reisterstown on March 1, 2005 and to the last sample in Timonium on April 4, 2005.

Several measures were taken to try to increase the response rate. A refusal conversion letter (Attachment L) was sent to CUs who refused to participate. This was done in three different batches. On March 11, 2005, 31 letters were sent; on April 12, 2005, 19 letters were sent; and on April 30, 2005, 16 letters were sent. Once a refusal conversion letter was sent, the case was reassigned to another interviewer. If the CU refused a second time, the case was closed as a final refusal. Of the 66 CUs that were sent a refusal conversion letters, interviewers were able to place diaries in two CUs and determine that six others were ineligible. The rest were closed as final refusals.

About halfway through the field period, on April 6, 2005, Westat and BLS staff met with the field interviewers. The purpose of the meeting was to hear the interviewers’ perspective on some of the problems encountered, as well as difficulty picking up diaries from some CUs. At the meeting we encouraged interviewers to continue to explain in their own words any aspect of

the study that they felt would help persuade people to participate (e.g., that the diary only takes about 15 minutes a day) and asked them to visit CUs at more varied times of the day and days of the week in order to contact those they had yet been unable to reach.

A letter was sent (Attachment M) to 65 non-contact cases on April 22, 2005. The letter appeared on BLS letterhead and was signed by a BLS representative. To help increase the chances that the CU would pay attention to the letter, it was mailed in a Federal Express envelope. Of the 65 cases that received this letter, we were able to place diaries in two CUs and determine that 17 CUs were ineligible for the study.

3. RESULTS

In this section, the results of the data collection are described. As a way of summarizing the different sources of information that was used in the analysis, Table 1 lists each of the different sources of data used in the analysis along, with the type of information that was collected. Many of these sources of data are described above, although not all.

In the first section, the results related to placing and picking up the diary are described. This includes the response rates and the level of effort needed to complete the work. The second section analyzes the data related to how CU members communicated about the diary, including what the main shopper told other CU members about the task and any discussion that took place during the collection week. The third section describes respondent reactions to the design of the two diaries. The fourth section describes the diary data.

Table 1. Sources of Data used in analysis

Source of Data	Method of Collection	Information collected
CU Roster Attachment B,C	Interviewer with main shopper	Listing of CU members; Personal Characteristics of CU members
Diaries	Self-administered	Expenses for week
	Review by staff	Data quality
Mid-Week Call Attachment D	Field Supervisor with interviewer	Completion of mid-week call; number visits to the CU
Closing Interviews	Interviewer with respondent.	Recall of expenses not entered in diary; use of diary; Communication among CU members.
In-Depth Interview	Project staff with respondents	Recall of expenses not entered in diary; use of diary; Communication among CU members
Call Records	Review by staff	# contacts to make mid-week call; to collect diaries.

3.1 Placing and Picking up the Diary

In this section, the overall response rates are reviewed, along with the extent to which they differ between the two experimental conditions.

3.1.1 Response Rate Analysis

As discussed in section 2, there were several stages of data collection for the survey. The first was to place the diary in the CU. Initially this involved determining whether the CU had at least 2 persons 14 years of age or older residing in the unit. If there was, there was a request to place the diaries in the CU. Interviewers generally determined eligibility of the CU before they began filling out the CU roster. For CUs that were difficult to contact, eligibility was also determined, by asking neighbors about the presence of anyone in the eligible age range. Once the diaries were placed, the interviewer made a mid-week call to the CU to see if there were any

questions related to the task. In theory, the interviewer was to contact every person that was supposed to receive a diary, regardless of the experimental condition. The final stage involved picking up the diaries that had been placed. For Condition 1, this involved collecting the diaries from the main shopper. For condition 2, the interviewer collected them directly from each respondent.

Table 2 provides the results of the initial stage of placing the diary in the CUs. Of the 243 CUs that were approached for the study, 19.3% agreed to have a diary placed, 24.7% refused a placement, 15.2% could not be contacted, 3.3% were some other type of non-response and 37.5% of the CUs were ineligible (not enough persons eligible to respond to the diary). The response rate for this stage includes in the numerator the total number of CUs where a diary was placed, as well as where it was determined that the CU was ineligible. All results are included in the denominator. This leads to a response rate of 56% for this stage. As would be expected, there is no difference in the placement of the diaries by the two experimental conditions. Interviewers were not treating the CUs any differently at this point in the process.

Table 2: Interviewing Results For Initial Consumer Unit Screening

Result Code	Condition 1		Condition 2		Total	
	N	%	N	%	N	%
Complete	21	17.4	26	21.3	47	19.3
Ineligible	42	34.7	49	40.2	91	37.5
Refusal	33	27.3	27	22.1	60	24.7
No Contact	19	15.7	18	14.8	37	15.2
Other	6	5.0	2	1.6	8	3.3
Total	121	100	122	100	243	

This response rate was quite a bit lower than expected for this stage of the study. It is also considerably lower than what is typical in other field studies which administer a one-time questionnaire. Interviewers reported that the primary reasons for refusing to cooperate related to either the respondent not having any interest in participating or not having the time. In a few CUs (around 7), the respondent mentioned that other CU members may not be willing to cooperate. In several of these CUs, the respondent actually checked with another CU member, who would not agree to participate (e.g., wife checked with husband and vice-versa).

The low response rate might be related to the relative inexperience of the Westat interviewers in administering a diary survey. Feedback from the interviewers emphasized respondent's reluctance to take on a task that would last for an entire week. Interviewers commented that the use of the booklets (diaries) made the task appear to be more complicated than it really was. The Westat interviewers may not have been as prepared as Census interviewers to counter these arguments. Research related to gaining cooperation in field surveys has shown that interviewer familiarity with survey material, as well as the ability to respond to questions in a confident and efficient manner, are key to obtaining cooperation (Groves and McGonagle, 2001). While the interviewers were experienced in household surveys, they did not have any experience conducting a diary survey, which is quite unique to the CEDS.

It may also be that the use of multiple diaries exacerbated the appearance of burden to the respondent. As noted above, there were a few respondents who explicitly asked other CU members about their willingness to participate. Respondents may have been reluctant to say that other CU members would take on the task. The interviewers did not believe the perception of burden was explicitly linked to the use of multiple diaries. They believed it was the perceived burden of having to do the task over an entire week. The use of multiple, rather than a single, diary may contribute to the perception that the task will take quite a bit of time. The size or number of pages of a self-administered questionnaire has been shown to be negatively associated with response rates (Bogen, 1996). The use of multiple booklets may have indirectly increased the perceived burden of the study in the same way.

The 47 CU's that agreed to have diaries placed had between 2 and 5 eligible respondents. A total of 124 diaries were placed across all the CUs. About half of the CUs had 2 eligible persons, 32% had 3 eligible persons, 13% had 4 eligible persons and one CU had 5 eligible persons. This distribution was similar across the two experimental conditions (see Table 3).

Table 3. Number of Eligible Respondents in Consumer Units Where a Diary was Placed.

Number of Eligible respondents	Condition 1	Condition 2	Total
2	11	14	25
3	8	7	15
4	2	4	6
5	0	1	1
Total	21	26	47

The response rate for the second stage was computed using the number of CUs that returned a diary among those that were placed. These data are shown in Table 4. Of the 47 CUs where diaries were placed, 13 did not return any diaries (28%). Twenty-six of the remaining 34 CUs returned all diaries that were placed. Of the remaining 8 CUs, at least the main shopper returned a diary in all cases.

Table 4. Diary Return Status for CUs with Placed Diaries

	Condition 1	Condition 2	Total
No diaries completed	6	7	13
Returned at least 1 diary	15	19	34
Returned all diaries	12	14	26
At least one diary missing	3	5	8
Total	21	26	47

As with the first stage, this represented a significantly lower return rate than was expected. The reasons the 13 CUs did not return any diaries were primarily related to the interviewer never being able to set up an appointment to pick them up. This seemed to be related to the respondents not actually completing the diary during the collection week. For example, there were several CUs where interviewers were told not to come to pick up the diary because nothing had been filled out. In two instances where no diaries were picked up, the interviewers indicated that at least one of the other CU members did not keep the diary for the week, which may have lead to the main shopper avoiding the appointment.

As with the placement stage, interviewers may not have pushed the possibility of picking up incomplete diaries at the end of the week. This was not emphasized in the training. This also points to a concern that CU members may have been reluctant to meet with the interviewer if other CU members had not filled out the diary. For any future field test, it will be important to train interviewers to push for picking up diaries, regardless of how many diaries are filled out within the CU. Training interviewers to stress the collection of information, even though the respondent did not fill out a diary or encouraging the main shopper to take on the burden of collecting the expense information as a proxy is something that should be considered when revising the procedures used in the present study.

Table 5 provides the distribution of returned diaries for the 34 CUs where at least one diary was returned by the number of diaries that were placed and the number of diaries that were returned. As noted above, most of the 34 CUs returned all of their diaries. Of those that did not return all, most returned all but one. For example, only 2 of the 13 CUs with more than 2 people did not return at least 2 diaries.

Table 5. Number of Returned Diaries by Number of Diaries Placed

# of Diaries Placed	# of Diaries Returned				Total
	1	2	3	4	
2	4	17			21
3	1	1	8		10
4	1	---	1	1	3
	6	18	9	1	34

These patterns do not differ by the two experimental conditions. Across the two experimental conditions, about the same number of CUs did not return the diaries (Table 4) and about the same percentage of CUs returned at least one diary.

The relative success of getting diaries from most of the CU members suggests that a multiple diary procedure could be very effective. Of course the CUs that participated represent a

relatively small proportion of the total sample. It may be that the responding CUs represent those that are the most cooperative.

At the person-level, a total of 124 diaries were placed across all the CUs. Table 6 provides the distribution of diary respondents by age and type of respondent (i.e., main shopper vs other respondent).¹ Most of the main shoppers were over 30 years old. The other respondents were distributed fairly evenly across the age groups displayed in the table. About 25% of the non-main shoppers were between 14 – 18 years old, with approximately 20% in the 19-29, 30-49 and 50-65 age groups, respectively. This distribution did not differ by experimental condition.

Table 6. Number of Diaries Placed by Type and Age

	Main Shopper		Other Respondent		Total	
	N	%	N	%	N	%
14-18	---	---	19	26	19	16
19-29	6	13	15	21	21	18
30-49	18	39	15	21	33	28
50-65	17	37	14	19	31	26
66+	5	11	10	14	15	13
Total	46	100	73	100	119	100

Of the 124 diaries placed, 73 were returned. As shown in Table 4, most of the non-response was from entire CUs not returning the diaries. Of the 51 diaries that were not returned, 40 are from the 13 CUs that did not return any diaries at all and 11 came from individuals within CUs where at least one diary was returned. The non-response by a collapsed set of age groups are shown in Table 7. The non-response patterns were not higher for any particular age group.

¹ Five respondents did not provide age on the HHCQ card and are omitted from the table.

Table 7. Number and Percent of Diaries up by Type and Age.

	Main Shopper		Other Respondent		Total	
	N	%	N	%	N	%
14-29	4	67	16	47	20	50
30+	30	75	22	56	52	66
Total	34	74	38	52	72	61

In reviewing the interviewer notes for the 11 non-respondents that were from otherwise responding CUs, the non-response was related to several different reasons. Six of the 11 were described as either not wanting to do it or not having the time to do it. Several of the respondents were said to have had no expenses, so did not feel it was appropriate to turn in a diary. The remaining non-response was due to miscellaneous reasons, such as language problems or being out of the house during the diary week.

A final CU level response rate of 40% results from multiplying the response rate at the screening interview (56%) by the response rate for CUs that returned at least the main shopper diary ($34 / 47 = 72\%$). A final person-level response rate can also be computed by multiplying the screener response rate by the percentage of respondents returning a diary ($73/124 = 59\%$) for a final rate of 33%.

As already noted, the response rate is well below that of the production version of the CEDS. It has already been mentioned that this may be due to the inexperience of the interviewers with a diary survey and, possibly, the use of multiple diaries. It should also be noted that the sample itself is different from the national CEDS. One difference is the sample for the present study was in a large inner-city area or in a close-in suburb of this city. Comparable response rates for the CEDS in areas like this are likely to be below the overall average. A second obvious difference is this study only included CUs with at least 2 persons 14 years of age and older.

3.1.2 Mid-Week Call and Picking up the Diary

One of the distinguishing features of a multiple diary procedure is the level of effort that may be required. The mid-week call asked interviewers to contact all CU members who were supposed to receive a diary. The distinguishing feature of Condition 2 is that interviewers were to pick up the diary from each of the eligible diary respondents. Both of these activities require an increased level of effort relative to placing one diary in the CU. This section describes how this procedure was carried out in the present survey.

Once placing the diaries in the CU, the interviewers attempted to contact each member of the CU to address any questions they may have about the survey. The interviewer also used this call to schedule an appointment to pick up the diary with the main shopper and, in the case of Condition 2, with each of the other individual diarykeepers. Interviewers had to make an average of 2 attempts to complete the mid-week telephone call. This ranged from having to make one attempt (50% of the cases) to as many as 6 attempts. In all cases, the main shopper was contacted. Interviewers were only marginally successful in contacting all the other eligible members of the CU. In 40% of the CUs where a diary was placed, the interviewer did contact every person. The success was not noticeably better across the two experimental conditions.

As one might expect, the lack of success in contacting the CU varied by the number of people in the CU. In CUs where two diaries had been placed, successful contact was made about 50% of the time. This compared to about 25% of the time for units with 3 or more eligible respondents.

Contacting every person in the CU was limited by the time constraints. The diary had to be picked up within one week after it was dropped off. This did not allow for much time to make multiple callbacks for a mid-week call. In most instances where all eligible respondents were contacted, respondents were at home at the time the interviewer made the mid-week call. The interviewer was generally unable to make a follow-up call to any respondent that was not present in the CU at the time of the first call.

Interviewers were efficient in scheduling their calls. Around 85% of the pick-ups were done with a single visit to the CU. Surprisingly, this did not vary by the two different experimental conditions. Interviewers tended to sacrifice prompt pick-up of the diaries for minimizing the number of trips to the CU. For the CUs where at least one diary was returned, the period between the initial placement of the diaries and picking up the diaries ranged from 7 to 17 days, with a median time of around 8 days.

3.1.3 Summary Placing and Picking Up the Diary

The response rate for this study was low at both stages of cooperation (placement and pick-up). Most of the non-response was due to entire CUs refusing to have a diary being placed and entire CUs not returning placed diaries. Respondents generally said they had very little time to keep the diary or they just were not interested in participating. It is not clear how much influence the multiple diary procedure had on this result. The field test was not designed to

empirically test this assumption. There were CUs that expressed explicit reluctance to cooperate after consulting with another person in the CU or in anticipation that someone else in the CU would not want to cooperate. It isn't clear if these concerns are unique to a multiple diary procedure. Even under a single diary procedure, one would need cooperation from other CU members. The primary difference with a multiple diary procedure is that one asks other members of the CU to keep their own diary.

The anticipated or explicit objection of other CU members to participating in the CU has several implications for future studies. The first is to consider a hybrid procedure that asks for multiple diarykeepers, but is willing to accept one person keeping the diary for reluctant respondents. Under this design, the interviewer would push for multiple diary collection. If the respondent is reluctant to ask everyone in the CU to independently collect the information, then the interviewer could give the respondent the option of taking on that responsibility. The small diaries would still be distributed to all eligible CU members. In this case, however, the diaries would be presented as an aid to keep track of expenses. The main shopper would be responsible for either putting all expenses in the large diary or filling in the small diary for each person.

Second, the next phase of the study should concentrate on developing refusal avoidance training that is tailored to the special requirements of the CEDS. This task may have already been done as part of the Census Bureau redesign of selected training materials (O'Brien, 2005). These materials (if they exist) should be supplemented by additional strategies that will be needed when distributing multiple, rather than a single, diary. This would involve convening CEDS field staff to get a sense of the types of cooperation issues they currently face and how they respond to avoid refusals. Within this context, strategies should be developed to address concerns with multiple diary distribution, including the possibility of accepting proxy reports from the main shopper.

A related recommendation for training when picking up the diary is to encourage cooperation even if not all eligible respondents have filled in their diaries. There were several instances where respondents did not allow the pick-up of diaries because others had not filled them out. However, even in these circumstances, interviewers should ask to visit the CU to at least collect data from the main shopper (e.g., combining the diary with recall of information). In the present study, this was not adequately emphasized. If partial data from a CU is accepted, interviewers should be trained to emphasize the importance of gaining cooperation from at least some of the respondents (preferably at least the main shopper), regardless of whether others in the consumer unit cooperated on the survey.

A third redesign activity should be to develop a survey package that minimizes the appearance of burden related to the multiple diaries. When first asking for cooperation, multiple diaries should not be shown to the respondent. Perhaps a package of materials could be created that does not overly influence the perception of burden.

The response rate and level-of-effort analysis did not find substantive differences between the two collection procedures. Interviewers collected approximately the same number of diaries using the two different methods. There was very little difference in the level of effort related to picking up the diaries. The reasons for failing to pick up the diary were primarily related to CU-level non-response, rather than failing to get a diary from an individual in an otherwise responding CU. Following up with each respondent, therefore, did not play a big role in determining the final success for picking up the diary.

3.2 Communication within the CU

The distribution, entry and picking up of the diary required respondents to communicate with one another in some way. The main shopper had to distribute the diary and provide instructions. If respondents had questions, they had to ask someone. If respondents shared expenses, there also had to be a way to decide how it is recorded across diaries. In order to understand how this communication worked within the CU, data was collected from respondents, in the form of debriefing interviews and more intensive follow-ups, on these communications. In this section, the results of this are briefly described.

3.2.1 Distribution of Diaries by the Main Shopper

The main shopper has the responsibility to distribute the diary to each of the eligible CU members and provide them with instructions on the basic diary task. In order to get a sense of how this process worked, main shoppers were asked what happened when they distributed the diary to others in the CU. Overall, there didn't seem to be very much communicated. When asked how they introduced the diary to members of the CU, only 8 of 27 main shoppers said they gave explicit instructions to the respondents. In four of these cases, the interviewer simply told the respondent to fill out the diary as indicated by the written instructions:

“Told them to fill it out”

“Just to fill it out....and let me know if she had any questions.”

“I told him to read the instructions in his book.”

Only one of these 8 respondents gave specific directions on what to do (“They must complete it in 7 days”). These data are consistent with the in depth debriefings that were done with 5 of the CUs. Generally, the main shoppers did not see the need to give detailed instructions.

There were several CUs where the interviewer placed the diary while all the respondents were present. This was the case in 3 of the 5 CUs where an in-depth interview was conducted. In this circumstance, there was no need for the main shopper to provide directions about filling in the diary. It is unknown how many of the other CUs had a similar situation (since this was not asked in the close-out debriefing), but we suspect that this may have been fairly common.

The debriefing data did seem to indicate that respondents did discuss the diary task with the main shopper. A significant minority of the CUs had a respondent that asked the main shopper a question. About a third of the main shoppers reported that another respondent in the CU asked a question about the task or said anything at all about the task. The types of questions they had were about specific issues related to entering purchases. The comments included:

“Time Frame”

“When to start logging.”

“He couldn’t understand how to fill out. We looked at the examples on page 5 to 7. Then we filled out the diaries.”

“About Lotto tickets and that I was reimbursing him.”

“Clothing sent for, backordered, so credit card was not charged. Did not list on diary.”

“We talked about all of it.”

“No big question – we talked it over.”

“My brother asked me what it was for, and who was it for.”

“We talked about our purchases.”

“We talked about how to subtract coupon amount off the items in grocery list.”

“Taxes, where they should go.”

There was a tendency to treat the task as an entire CU, despite the fact that each individual respondent was provided a diary. This became apparent from several of the in-depth interviews.

In one 3-person CU, the main shopper kept the diary for her elderly mother. She also kept track of her brother's expenses on a daily basis. She did this by asking her brother about his expenses every night. In other CUs, the respondents filled out the diary as a group, rather than individually. In three particular cases, the respondents actually thought it would have been more logical to have a single diary for the entire CU, since this was the way the information was collected.

These results suggest that future implementations of the multiple diary might place more emphasis on the main shopper providing instructions about basic facts related to the diary keeping task. Given that only about 25% of the main shoppers provided any instructions at all when distributing the diary suggests that the diarykeepers were not fully informed on the task that was to be completed. It isn't clear if this is a serious problem. For a number of CUs, the interviewer distributed the diary to the entire CU, so there was no need to provide instructions. In those instances where the main shopper had to distribute the diary, it is not clear serious errors were made as a result of not providing instructions. Redesign of the procedures should consider a short handout that accompanies the small diary. This handout would include a few bulleted points that diarykeepers should be aware of when recording expenses. This handout would be included as a second page to the cover letter that was already included with the diary packet given to each respondent.

3.2.2 Overlap of Expenses and Concerns about Confidentiality

One potential source of error with a multiple diary procedure is respondents reporting the same expense on two different diaries. With a single diarykeeper, there is not a possibility of overlapping expenses. For a multiple diarykeeping design, there is not a natural control on double counting the same expense.

During the closeout interview, main shoppers were asked if there were ever situations where they shared an expense with another CU member. Of the 26 respondents asked this question, seven said that this occurred. The types of situations that were described included:

“Snowboarding”

“Going to a restaurant”

“Daughter using a gift card and I paid the difference”

“Going shopping together”

“Rent”

In about half of these cases, the main shopper said they had talked to the other CU member about who should record the purchase. For some purchases, it was obvious who should record the purchase by relying on who actually paid the bill. For example, when a couple went shopping together, it was clear who spent money on particular items. Similarly, two roommates who share the rent typically write separate checks.

The information from the in-depth interviews suggests that communication about shared purchases was a bit more common than indicated in the close out interviews. Several of the in-depth interviews indicated that CU members communicated specifically about who should write in a purchase. This was done naturally in those CUs where the diaries were filled out as part of a group process. For example, one respondent indicated that she scratched out a purchase of food at a restaurant once she saw that it was also entered in someone else's diary. In another instance, a husband and wife discussed who should record a bill. There was one CU where the non-main shopper kept track of all the expenses she was involved with, regardless of who spent the money. This person used the "notes" section in the back of the small diary to keep track of these. The particular purchases were then assigned to who actually paid the money (the respondent or the main shopper). The entry was made in the respondent's diary if it was designated as something that she directly purchased.

The diary entries were reviewed for one-time expenses that represent shared expenses, including CU utility bills, mortgages and insurance payments. There were no instances where these large expenditures were reported in more than one diary.

A second concern with the multiple-diary procedure is that respondents may be reluctant to turn in their diaries to the main shopper when it was time to get picked up. During the closing interview with the non-main shoppers were asked if they would have a problem with a procedure that asked them turning in their diaries to the main shopper. None of the respondents seemed to have a problem with this type of procedure. This was asked of 7 non-main shoppers who were in condition 2, as well as the respondents participating in the in-depth interviews. None of these individuals indicated any concern with this procedure.

3.2.3 Summary of Communication Within the CU

The main shopper was not particularly vigilant in communicating information about how to fill out the diary to other CU members. The main shopper did not provide a great deal of instruction about the diary task. In the next version of procedures, the CED interviewers should

place more emphasis on providing specific instructions to other respondents. It might also be useful to have the main shopper hand out an extra page of written instructions that summarizes the diarykeeping task (e.g., reporting week; dealing with shared expenses). These instructions would have 4 to 5 bulleted points that would not overwhelm respondents, but would provide them a place to start when getting an idea of the task.

Shared or overlapping expenses occurred in a number of CUs. The types of items that were “shared” seemed to be of two types. One was where a purchase was made when two people were present (e.g., sharing a meal; shopping together; joint activities like snowboarding). The second was a shared CU expense, such as a bill. In most of the cases of shared expenses, the overlap seemed to be adequately resolved by having the person who paid the money to record the expense. The other way this was resolved was to explicitly discuss the expense. In some cases, this occurred naturally as the CU filled out all the diaries together.

Although based on a very small sample, these results would not indicate a serious issue with double counting expenses. Most seem to be taken care of through a natural logic carried out by respondents. In some CUs, there will naturally be joint discussion about who should enter certain shared expenses. As an additional precaution, the diary procedure should add debriefing questions with the main shopper which ask about the potential overlap with other CU members.

A significant number of the non-main shoppers asked questions during the reporting week. To facilitate timely and accurate answers for the diarykeepers, it would be useful to continue the practice of providing respondents with a telephone number that could be used to ask questions related to filling in the diary. The line could be used either by the main shopper or another diarykeeper in the CU to address questions that cannot be resolved from the written instructions.

Under the Condition 1 procedure, the non-main shopper turns in their diary to the main shopper. There did not seem to be any significant resistance among respondents to having the main shopper pick-up the diaries. This might stifle reports because of any perceived lack of confidentiality, although this would also be said to be true for the current single diary procedure, where CU members are supposed to report all purchases to the diarykeeper.

3.3 Diary Format

As part of both the closing and in-depth interviews, respondents were asked about the use of the diaries. In this section we discuss the comments respondents had to each of the diaries.

3.3.1 Small Diary

As part of both the close-out and in-depth interviews, respondents were asked to comment on each of the major sections of the diary, including the first page, the instructions at the beginning, the entry pages in the middle and the pages with examples at the end of the instrument. A total of 9 close-out interviews were conducted with persons who used the small diary and 4 of the in-depth interviews with users of the small diary. Data on the small diary was also collected by a review of each diary.

Respondents to the close-out interview thought the small diary was relatively easy to use. Examples of comments were:

“The way it was laid out made it easy to follow”

“I thought it was self-explanatory, so it was not difficult”

“Made it easy to know where to enter purchases”

Similarly, respondents to the in-depth interviews found that the diary “spells everything out” and was “easy” and “self-explanatory”.

The inside cover and first page of the diary list the days of the reporting period, the persons in the CU and the purpose/uses of the survey. Most of the respondents to the closing interview reported skimming this section. Each individual piece of information on these pages was mentioned at least once by one of the respondents. Several mentioned the list of days as a way they figured out the reporting period. Several others mentioned the text that provided the goals and purpose of the survey. The in-depth interviewees did not report reading these pages as frequently. Several said they had skimmed these pages, but had not paid much attention to them prior to filling in the diary.

The second and third pages of the small diary provide instructions on task. It includes the general rules (page 2) and answers to questions that respondents might have. As with the first few pages, almost everyone reported in the close-out interview skimming this

section pretty quickly before they started the diary task. In addition, several people reported referring back to these sections when filling out the diary to answer specific questions. When asked which parts of these pages they found most useful, most pointed to both pages, rather than singling out a particular instruction or statement. As with the inside cover and page 1, the in-depth interviewees reported not paying as much attention to pages 2 and 3. A few reported skimming the information, but no-one said they read these pages in any depth.

The entry pages were reported to be straightforward by both the close-out and in-depth respondents. Probably the most used part of the page were the examples listed on the top. Several respondents reported remembering something they would have otherwise forgotten once looking at a particular example. Our review of the entries made to these diaries is consistent with this overall evaluation. There were relatively few obvious entry errors. In 9 of the 35 diaries, a respondent crossed out a particular entry. In many cases, this was done because it was originally placed in the wrong section. Respondents were very assiduous in filling in the day the expense was made, with only 6 diaries having at least one entry without a day. In most of these cases, the blank seemed to be equivalent to a “ditto”, where there was a blank surrounded by entries with the days filled in. The blank was likely indicating that this purchase was for the same day as the expense immediately above it.

The biggest problem respondents had with these pages was figuring out which section of the diary particular purchases should be placed. A couple of respondents had problems making the distinction between food for home and food away. A few other respondents found the categories generally constraining and would have preferred to be able to enter their information on a single page. This issue with the categories, of course, is not unique to the small diary.

There were sample entries starting each of the entry pages. The intent of these were to show respondents some specific examples on what is needed when filling in the diary. Respondent were not specifically asked about these in the close-out interviews. Several of the in-depth respondents said they used these examples to answer specific questions related to how to make entries. For example, one respondent used this as a reminder to put in the date of the purchase. Another respondent used them to help decide where he was supposed to start entering information on the page.

Last pages of the diary had a list of examples sorted by expense category. This list was intended to replace what is on the front flap of the large diary. As one might expect, a significant number of respondents did not see this information (a similar pattern is evident for the back flap

on the large diary). Those who did see the information, however, did find it useful for reminding them of things they should be recording. It also provided a guide on which section an expense should be recorded. For example, one respondent said “Made it easy to know where to enter purchases”.

Space on the small diary did not generally seem to be an issue. The “notes” section on the back page was used by only one of the 35 respondents filling in the small diary. One respondent commented that the space left to write down the type of item was not big enough. However, inspection of this person’s diary did not seem to indicate any problem with the information.

3.3.2 Large Diary

The first three pages (and inside cover) of the large diary are almost identical to the small diary. This section includes a listing of each of the CU members, the reporting days and an explanation of what to record. As with the small diary, most of the respondents to the close-out interviews reported at least skimming these sections. The in-depth respondents did mention seeing the material in this section of the diary, but generally reported not paying much attention to it.

The large diary has 4 pages of explicit examples on pages 4 through 7. All the respondents, both those interviewed as part of the close-out or the in-depth interviews, said they had seen these. A number of people used these to provide guidance on how to fill out the entry pages. It used them to not only get an idea of the general format, but also the level of detail that is being requested and the types of items that should be entered. Respondents described this by saying such things as:

“It showed where each thing belongs. It helped me to place the articles.”

“I could use them to see how to fill out my items.”

“I could see how to enter my items”

The one issue that came up in the close-out interviews was the density and complexity of the page design. One respondent described it as “Too much, confusing”, another said “Too much color and lines”, while a third respondent made a specific comment about the balloons “Explanations on side too much”.

For the entry pages, both the close-out interview and in-depth respondents reported generally understanding what to do. In several instances, users did get a little confused or lost when first trying to make an entry by mistaking the separate sections as representing different days of the week. Nonetheless, once understanding how the pages were organized, most respondents found filling in the diary to be relatively easy. As with the small diary, the examples at the top of the page were noticed and used extensively. In response to an open-ended question about what they found most helpful on this page, the overwhelming majority mentioned the examples. As with the small diary, the most confusion for entering items is which section to place the expense.

Another unique feature of the large diary are the flaps that are on the front and back of the document. The in-depth respondents all reported seeing the flap on the front cover, which contains lists of examples. Two of these four respondents reported using these flaps to help them figure out where to classify some expenses. In most instances, the front flap was found when first browsing and opening the diary. One respondent reported noticing the flaps by the arrow that points to the front and back covers located on pages 2 and 3. The flaps on the back were not mentioned as being used very often by the in-depth respondents. One person mentioned using them to help with a frequently asked question, but the others mentioned skimming the content when first receiving the diary. This pattern was also reflected in the close-out interviews, with respondents describing the front flap as being useful for the diary task. There were fewer respondents who reported the back flap as being useful when rating its utility, as well as in open-ended comments about the flap.

3.3.3 Summary for Diary Formats

The patterns of use of both the small and large diaries are very similar to what was observed in the cognitive interviews. For the small diary, respondents tended to skim over the first few pages of instructions and went directly to the entry pages. However, unlike the cognitive lab study, the results from the present study indicated that respondents did make use of this information while filling out the diary. They reported going back to this section of the small diary to help answer questions that came up for particular entries.

The instructions on the large diary are more extensive. There are pages similar to those on the small diary, but also several pages of annotated instructions, as well as two flaps (one on the front and back). The feedback on the large diary reinforced the utility of the written instructions on the inside cover and the first few pages. However the most used instructions seemed to be pages 4 through 7, which provide annotated examples. Many of the comments on

instructions from the close-out interviews referred to using these as a guide to not only the type of information that was to be provided, but general guidance on what was expected in an entry (e.g., level of detail). There were several respondents who thought the design of this page was too complicated. The inclusion of the annotation in the balloon captions may introduce a level of detail that may not be necessary for the primary purpose of illustrating how entries are to be made into the diary.

The small diary does not include a set of example pages like those in the large diary. They were excluded to keep the small diary as simple and short as possible.² To provide a more concrete picture of what should be entered, the small diary included pre-filled examples on the first line of each entry page. Users did not comment specifically on these entries, so it is unclear whether these are serving their intended purpose. However, given that there seemed to be relatively little confusion on how to enter information into the small diary, we would recommend maintaining the current strategy of using the pre-filled examples, in lieu of adding several more pages of instructions/examples to the small diary. This keeps the perceived burden of the task for those not selected as the main shopper to a minimum.

A second difference between the large and small diary are the two flaps attached to the large diary. Some of the information on the front flap has been incorporated into the back part of the small diary in the form of additional examples. Several respondents commented that they did not see this part of the diary. We believe this is because of its location, after the main entry pages. Those that did see the pages found them to be useful for both recalling particular expenses, as well as figuring out where to classify the information.

It isn't clear how to increase the use of these examples. One natural recommendation would be to move them to the front of the diary, before the main entry pages. However, this introduces another layer of pages that may result in higher perceived burden on the task. Other design solutions are not readily apparent.

The entry pages of the small diary were understood by respondents. The main problems respondents had related to classifying purchases into the correct section. We have no clear recommendation to solve this problem. It seems inherent in the diary task itself and related to how respondents interpret each expense category.

² For example, if one were to put in a full page of examples for each section in the small diary, this section would be as long as the actual entry pages.

3.4 Diary Data

The data entered into the diary was coded by BLS. A review of the diary entries in the small diaries was also conducted to check for issues respondents may have had when entering information. In this section, we describe the results of this analysis.

3.4.1 Missing Data for Entries

One way to assess the data quality of the entries of the small diary is to compare it to the large diary. The two different diaries do differ somewhat in the layout of the pages. The large diary has everything located on a single page, while the small diary spans two different pages. The small diary has an initial column asking for the day of the purchase, while the large diary does not require this type of entry. The sections order the columns differently. For example, Food and Drinks Away from Home in the large diary has the two attributes before the total cost column, while the small diary has one attribute and the total cost column on the first page and the location of the second attribute on the second page.

There were a total of 1707 entries made into the diaries returned across all the CUs. Of these 1707, 32 had entries that could not be assigned a UCC code (e.g., credit cards bills), leaving 1675 entries. The extent there was missing data for costs and item attributes was tallied among these entries and crosstabulated by the type of diary (large vs. small).

There were not big differences between the two different types of diaries and whether or not there was missing data for either the expense or individual attributes. Virtually all of the codeable entries had cost information associated with them (96%), with virtually no difference between the two types of diaries. As one would expect, there was considerably more missing information for the individual attributes. There was either very little difference between the extent of missing information between the two different types of diaries or the small diary had slightly lower rates. For example, for “Food and Drinks Away From Home”, respondents are asked to fill in two attributes (type of meal; where the purchase was made). The overall rate of missing information for these attributes was between 10% and 20%. For the type of meal, there was slightly more missing data for the small diary (12% vs. 21%), while the opposite was the case for where the purchase was made (20% vs. 15%).

For the other two sections where attributes are collected (Food for Home Consumption; Clothing, Shoes, Jewelry, and Accessories), the rate of missing data was lower for

the small diary. For Food for Home Consumption, about 25% of the large diaries were missing on the packaging compared to around 6% for the small diary. Similarly, the rates missing data for gender and age for clothing was lower for the small diary (36% vs. 11%; 40% vs. 30%). One has to be cautious in drawing any firm conclusions about the diary design because of the small samples and the likely differences in the types of purchases being made between the main shopper and non-main shoppers. Nonetheless, it is interesting to note that a common feature the attributes have where the small diary had lower rates of missing data is that they are on the second page of the small diary. This may make these particular features stand out more when reading across the columns.

One possible advantage of Condition 2 is that data quality might be increased because the interviewer talks to each respondent when picking up the diary. When breaking the above information by diary condition, there is very little evidence of this, although the sample sizes are quite small. In some cases there is slightly more missing data for Condition 1, but for other attributes there is more missing for condition 2.

3.4.2 Amount and Type of Information for Large and Small Diaries

Analysis of the type of information entered in the two types of diaries is restricted to those CUs where at least one non-main shopper returned a diary and the entry had usable cost information.³ As one would expect, there is, on average, more entries made by the main shopper (36 vs 12). The distribution across the major sections of the questionnaire are also quite different (Table 8). The main shopper entries are more likely to be in the Food for Home Consumption (48% vs. 25%) and the non-main shopper has more entries in the Food Away from Home (15% vs. 39%).

³ This includes a total of 23 of the 34 CU that returned at least one diary. The data are based on 23 main shoppers and 31 non-main shoppers.

Table 8. Distribution of Entries by Type of Respondent

Section	Main Shopper	Non-Main Shopper
Food and Drinks Away From Home	15%	39%
Food and Drinks for Home Consumption	48%	25%
Clothing, Shoes, Jewelry, and Accessories	8%	7%
All Other Products, Services, and Expenses	28%	29%
Total	100%	100%
N	1265	410

The type of expense is correlated with the age of the respondent. The younger respondents were more likely to report in the food away from home category. Fifty percent of the expenses for the 14-18 year olds were in this category and 39% were in this category for the 19-29 age group. This compares to 21% for the entire sample.

The average total expenditures by the two types of diarykeepers is relatively close, with an average of \$573 for the main shopper and \$303 for the non-main shopper. This distribution reflects several non-main shoppers who entered very large expenditures. For example, in one CU, the spouse of the main shopper entered a mortgage payment for over \$1000. In another instance, a spouse entered several large insurance payments adding up to over \$2000. Presumably in a one diary design, these expenses would be entered onto the single CU diary. An important question that will need to be addressed in the next study will be whether these types of large CU payments that are not made by the main shopper are better covered or more likely to be missed with a single diary procedure.⁴

⁴ It is also true that for these large purchases, the quarterly interview survey is most likely the main source of information for use in the CPI.

Table 9. Mean Expenses by Section of Diary and Type of Respondent

Section & Type of Respondent	Mean Expenses	# of Respondent	# of Expenses
<u>Food and Drinks Away From Home</u>			
Main Shopper	42.87	20	106
Non-Main Shopper	38.25	23	157
<u>Food and Drinks for Home Consumption</u>			
Main Shopper	70.17	21	427
Non-Main Shopper	23.10	20	102
<u>Clothing, Shoes, Jewelry, and Accessories</u>			
Main Shopper	122.56	12	76
Non-Main Shopper	59.21	20	102
<u>All other Products, Services no Expenses</u>			
Main Shopper	408.06	23	233
Non-Main Shopper	303.64	24	109

The larger payments are in the “All Other Products, Services and Expenses” section. This can be seen in Table 9, which provides the average expenditures by type and section of the diary. The expenses for the main shopper are generally higher than the non-main shopper for all categories, except for food away from home. The largest average expense is for the miscellaneous category, where the non-main shopper is spending a considerable amount.

One possible advantage of a multiple diary procedure is that it would pick up relatively small expenses from younger persons and/or persons who are not intimately associated with the overall expenses of the CU (e.g., teenager; grown child). This is suggested by the observation that many of the purchases reported by persons age 14-29 are in the food away from home category. Table 10 provides the average expenses by age categories. As can be seen, those who are between the ages of 14 and 29 did report significant expenditures during the reporting week. Overall, 12% of the purchases were made by persons in this age group. Their total

expenses accounted for approximately 8% of the total expenditures reported by all respondents. This percent almost doubles to 15% when concentrating on those that just filled out the small diary.

Table 10 Mean Expenses by Age of Respondent

Age	Mean Expense	# of Respondents	# of Expenses
14-18	103.42	6	72
19-29	155.26	9	123
30-49	599.52	12	472
52-65	616.03	19	402
>65	385.85	9	162

3.4.3 Summary of Results for Diary Data

The entries on the small diary were relatively complete (e.g., compared to the large diary). The level of expenditures across the two different types of diaries suggests that a multiple diary procedure could substantially increase coverage of all types of expenditures. Taken as a percent of the expenditures of the main shopper, the non-main shopper expenses were quite large. Many of the larger expenditures would, presumably, be captured within a single diary procedure. For example, one would assume that the spouse of the main shopper would provide information on expenses like the mortgage and bills that are paid during the reporting period. Nonetheless, substantial expenses were reported for items that are believed to be under estimated in the current diary, such as food away from home and clothing purchases. In both cases, the small diary picked up levels of reporting that substantially supplemented what was reported by the main shopper. This was also the case when examining expenses for the youngest age groups (14-29). While these age groups did not report large expenditures, their total expenditures did add up to a considerable amount (approximately 8% of the total).

4. Conclusions and Recommendations

In this section we summarize the conclusions with respect to how the multiple diary procedure worked in the field and compare the two different experimental procedures. In the final section, recommendations are made with respect to the next steps for evaluating a multiple diary procedure.

4.1 How Did the Multiple Diary Procedure Work in the Field?

The biggest challenge facing the use of a multiple diary procedure is its impact on the response rate. The present study had a low response rate, although it is impossible to know how much of this was due to the multiple diary procedure (*vis-à-vis* a single diary procedure). Nonetheless, we believe part of this reluctance was because of the perceived burden of the procedure. Many respondents reported not having the time and/or thought the study posed too much effort. Interviewers reported that respondents seem a bit overwhelmed by the idea of keeping track of all their expenses in the diaries that were presented. The distribution of multiple diaries contributes to the perception of burden respondents get when first approached to do the study. There were several instances when respondents refused to participate after checking with others in the CU. There was an underlying reluctance to commit others in the CU to keeping the diary for a full week. There was also quite a few CUs where none of the diaries were returned (13 out of 47). We suspect this was due, in part, to the main shopper failing to distribute and/or collect diaries from others in the CU.

For CUs that did respond, the reporting process involved significant communication between CU members. In a number of CUs, the task was viewed as a group activity, where respondents either completed the task together or would consult with each other. A number of respondents also raised specific questions about the diary with the main shopper. Despite this general trend in communication among CU members, the main shopper did commonly provide explicit instructions about how to use the diary. They seemed to primarily rely on the diary's instructions to provide respondent's guidance on what to do.

There were very few issues related to respondents recording the same expenses in the same diaries. When asked about sharing expenses (e.g., CU bills; common shopping trips), respondents reported very few instances when it was unclear who would record the particular expense. On the whole, respondents adapted the rule provided in the instructions that the person

that paid for the item should record the expense. This seemed to resolve many of the potential overlaps. The general pattern of communication among CU members described above also helped to resolve overlapping expenses. Several CUs reported consulting with other household members when deciding on who should record a particular expense.

Significant expenditures were reported by respondents who would normally not keep their own diary. The expenditures in the small diaries were disproportionately in the “Food and Drinks Away From Home” section. The largest expenditures were reported in the fourth section of the diary (All Other Products and Services) in the form of bills or large purchases. Expenses reported by younger respondents (14-29) made up 8% of the total reported by all persons in the survey. These results are consistent with the idea that multiple diaries would add to the reporting of expenses for relatively small purchases. However, the fact that there was a number of large purchases recorded in the small diary suggests that the multiple diary procedure and could affect these purchases as well.

The quality of the data entered on the small diary was comparable to that entered on the large diary. All of the fields were consistently filled, including the day the expense was made. Respondents to the small diary also used the instructions in the same way as users of the large diary. They generally skimmed the instructions at the front and relied heavily on the examples placed on the entry pages. Respondents did not generally use the examples placed in the back of the small diary or the note page on the back cover.

4.2 How did the Different Experimental Procedures Compare?

The study did not result in any significant differences between to the two experimental procedures. Response rates were approximately the same regardless of whether the interviewer picked up from the main shopper or from each eligible respondent. The major source of non-response at the time of picking up the diary was for entire households to refuse to make an appointment. Given this, there was very little opportunity for the two experimental conditions to differ very much. The level of effort needed to pick up the diaries was the same across the two conditions. Interviewers generally made a single appointment to pick up the diaries. For Condition 2, where the diaries were being picked up from each eligible respondent, the appointments were made for a time when all of the household members would be present. This may have lead to delaying the pick-up of the diaries past the required one week window.

There did not seem to be a big concern among household members with respect turning in the diary to the main shopper. The small number of Condition 2 respondents that were debriefed in the close-out interview did not express any concern with using a procedure that turned in their diary to the main shopper. Similarly, the respondents to the in-depth interviews were not concerned with the confidentiality of their responses.

These results are based on a very small sample sizes, so it isn't too surprising that significant differences were not found between the two experimental procedures. Nonetheless, the Condition 2 procedure did not reveal big advantages with respect to getting better cooperation or providing better quality data. To some extent, the opposite was the case. Interviewers found it difficult to get in touch with all respondents for the mid-week call. With the time constraints of having to pick up the diary at the end of each week, this problem is exacerbated and can jeopardize the ability of the interviewer to pick up all the diaries in a timely fashion. For this reason, it is recommended that the Condition 1 procedure be used in the next phase of the study. This minimizes costs related to interviewer efforts to retrieve the diaries and it maximizes the interviewer's ability to collect all of the diaries in a timely fashion.

4.3 Recommended Next Steps

This study has shown both the advantages and disadvantages of a multiple diary procedure for the CEDS. The possible advantages relate to the increased coverage it could give to the expenses by all household members. The possible disadvantages are the effects the procedure might have on the overall response rate. It is recommended that for the next phase of the research, a larger test be conducted that directly compared the current single diary procedure with a multiple diary procedure. This would permit direct comparisons of the two procedures across several different dimensions, including the potential for non-response bias and the extent to which expenditures are covered with each methodology.

The multiple diary procedure to be implemented would be very similar to that used in the present survey. It is recommended that the Condition 1 procedure be used for the reasons given in section 4.2 above. The diary would be placed with a main shopper, who would be responsible for distributing it to the other members of the household. The main shopper would also be responsible for collecting the diaries in time for the interviewer to pick them up a week later.

There are no recommendations related to changing the format of the small diary. It worked effectively among the persons that filled it in. There were very few errors detected in the entries and respondents generally thought it was simple to use. However, the initial package distributed to the main shopper should be re-designed to minimize the perception of respondent burden. This package should enable the interviewer to insert diaries into a single container that is handed to the respondent.

Modification to the multiple diary procedure should consider methods that can increase the response by both households and individuals. One set of modifications would be to give the main shopper the option of keeping the small diary him/herself for any respondent that they believe will not be willing to keep a record of their expenses. If this situation arises, interviewers would ask the main shopper if he/she would be willing to keep track of the respondent's expenses and record it in the large diary.

A second set of modifications should be made to arm the interviewers with explicit refusal avoidance tools at both the initial placement stage, as well as when the diaries are picked up (O'Brien, 2005). The demands of the CEDS are unique. For this reason, it is recommended that a special training module be developed on refusal aversion that draws upon the experience of Census Bureau CEDS field staff. This module would contain a clear statement of purpose of the CEDS, as well as information that can be given to respondents to address concerns they have when asked to participate on the study. Once the training module is compiled, it would be administered as a separate, 4-6 hour, component of the training for the field test.

Within this module, respondent concerns related to the multiple diary procedure should be addressed. One concern is when the main shopper is reluctant to commit other members of the household to participating in the survey. Interviewers should be trained to emphasize that direct participation by all members is not required. The main shopper can collect the information directly (as in the current procedure) or, if that fails, not collect information from that person at all. If no information is provided, then the interviewer would be required to document which members participated and which did not.

Similarly, the training module should delineate pick-up procedures that emphasize that not all the diaries have to be completed when the interviewer visits. Interviewers would ask to pick up diaries, even if the main shopper reports that they haven't been filled out. Priority would be given to picking up the main shopper's diary, along with other diaries that had been filled out at that point in time.

The evaluation of the next phase would need to assess the tradeoffs in data quality that result from the two procedures. For example, a single diary procedure may result in a higher overall response rate, getting responses from a higher percentage of households. The multiple diary procedure should increase the reporting of expenditures of certain types (e.g., food away from home; clothing). The question for the next test is whether added non-response is worth the additional coverage of expenditures. The answer to this question will depend on which expenses are being covered and which types of respondents are being left out as a result of the higher survey non-response.

Sample sizes for this test should be large enough to examine individual expense categories important to the CEDS analytical needs. For example, it would be useful to look at these tradeoffs for those expense categories that are currently taken from the CEDS for the CPI relative to the quarterly interview survey.

It is important to get the CEDS Census Bureau field staff involved in further development. The Census Bureau is very experienced with the CEDS and can provide invaluable insights into the methods used on the current survey related to obtaining respondent cooperation and obtaining valid diary entries. Adapting the multiple diary procedures to work within the working environment of CEDS interviewers needs to be done. All other things being equal, it would be best to have the Census Bureau field staff carry out the next test. Ultimately, the multiple diary procedure should be compared to what is being collected by the Census Bureau. The best way to do that would be with Census Staff. If this is not possible, it would still be important to involve the Census Bureau in development of training and refusal avoidance strategies.

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