

## WHAT DOES IT REALLY MEAN TO BE USER-FRIENDLY WHEN DESIGNING AN EXPENDITURE DIARY?

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Interest in how Americans spend their money has a long history. During the 1870's the Massachusetts Bureau of Labor Statistics conducted the first such studies to evaluate the welfare of workers after their immigration to America. These early studies were mainly concerned with the amount of money a family needed to live (Jacobs and Shipp, 1990). Today, the Bureau of Labor Statistics (BLS) is mandated to report detailed information on all of the ways that Americans' spend their money. To accomplish this objective, BLS relies on two separate surveys: the Quarterly Interview Survey and the Diary Survey. In the Diary, respondents are asked to complete a paper diary and record all their weekly expenses. The focus of this report is on data collection in the Diary Survey.

When it comes to detailed expenditure information, not all purchases are equally difficult or easy to remember and record. Some expenditures, such as daily bus fare, are often part of a "work commute" mental script and may be easily recalled. Other purchases, like sodas and snacks from vending machines, tend to be more mundane, buried within the concerns of daily activities, and more easily overlooked. But the diary mode of data collection has long been recognized as an especially useful tool for collecting daily records of these types of frequent, low-salience purchases before they are forgotten (Sudman and Bradburn, 1982). The diary also makes it possible for BLS to collect the follow-up details on purchases that are used to produce the weights for the Consumer Price Index<sup>1</sup>. Such information would be difficult, if not impossible, to collect accurately without some means of recording the purchases during the week as they occur. Another advantage of using the diary mode of data collection is that the instrument itself provides an opportunity to inform the respondent of the level of detail that is required by using examples and category headings. These headings and examples serve as memory cues and have been found to increase reporting, when compared to the more open journal type of format. Respondents also report that section headings make a diary easier to fill out (Sudman and Ferber, 1979).

Over time, the diary approach has also been adopted by numerous researchers for consumer panels to track household consumption, participants' reactions to new products appearing on the market,

and social trends. Through their work, it has become abundantly clear that one of the most important features for any diary is respondent interest. Those who drop out of expenditure studies are often those participants with small budgets, unsystematic shoppers, or those who have a disinterest in shopping. Busy respondents and large households are also prone to nonresponse, although high interest has been shown to override the "busy" factor. Finally, low education has also been associated with difficulty in keeping and completing an expenditure diary (Carmen, 1974). Taken together, all these factors highlight the fact that diary "user-friendliness" is absolutely essential if respondents are to be engaged in the onerous task of accurately and completely reporting the details of the household's expenditures.

### Creating a User-Friendly Diary

Over the years, BLS has conducted numerous studies and attempted to redesign the diary<sup>2</sup> with the goal of improving the response rates and estimates. The prevailing thought was that if a more user-friendly diary could be created, this would translate into higher response rates and better quality data. There was, however, no clear consensus of what "user-friendly" meant for a diary. Yet several of the major respondent difficulties were recognized and included the following.

#### Recall versus Recognition

Respondents often have problems reporting an entire week's worth of expenses. It is difficult to remember every item purchased, the precise costs, and all the follow-up information that is required. In 1985, BLS conducted a study addressing memory issues by contrasting a "recall" approach with a "recognition" approach. The recall diary used a standard approach by providing several major expenditure categories. The recognition diary provided expanded lists of many major expenses within the categories and respondents were asked to simply scan the lists, identify their purchases, and record the follow-up details. While recognition is easier for respondents than recall, it is impossible to list every conceivable expenditure. Consequently, when respondents reached the ends of the lists, they simply proceeded to the next list, and did not record missing items in the "other, please specify" sections.

A modified solution to the problem was also tested. Using the open "unprompted recall" design,

subcategories were added to the major expenditure sections. Subheadings were used to list sets of expenditures to serve as recognition cues. While this modified approach proved more successful than either the simple recognition or the recall method, it made the diary longer and created a burdensome classification task. Not only must respondents remember their expenses, but they must also locate the appropriate section and subsection in which to record it.

#### Navigation Issues

The current BLS diary collects a record of all money that is spent during the week. In order to make the entries, respondents must first locate the correct day of the week on which an expenditure was made. Next, the appropriate expense category is selected. Finally, a subcategory is identified where the entry is then recorded. As a result, respondents are confronted with a number of navigation problems. In 1996, BLS contracted with The University of Michigan and Envisions graphical arts firm to investigate these navigational issues. Envisions developed a prototype with hierarchical shading to guide respondents through the decision-making path leading to the correct place to make entries. This began to make the task easier, but the instrument was still a long, dull, administrative document. There were few, if any, features to grasp and hold a user's attention and interest.

#### Other Burden Issues

By raising questions about the respondent burden associated with the length and navigational features of the diary, focus also began to shift toward understanding the difficulty inherent in the whole diary-keeping task itself. This includes the problem of proxy reporting for household members who may be responsible for different aspects of the household shopping and problems associated with "private" or "personal" spending.

### **Phase 1**

In 2000, a joint BLS and Census Bureau team set out to develop a "user-friendly" diary that was more attractive and appealing, easier to understand and navigate, and less burdensome to complete. As a first step, an outside contractor developed 3 prototype diaries that were distinguished by the color of their covers and by their internal structure:

#### Prototype 1

Entitled "Your Daily Notebook," this diary was identical to the current BLS production diary, but with icons, color, and a portrait, book-like orientation. It was divided into 7 days; within each day there were 5 major expenditure categories. Within each category, there were the many subcategories that identify subsets of expenditures

and indicate where entries should be recorded. Because of its peach cover, this was referred to as the **Peach "Current" Diary** It was 144 pages long.

#### Prototype 2

Entitled "Track How You Spend Your Money," this diary was divided into 7 days; within each day there were 5 major expenditure categories, but there were fewer subcategories. Tabs were added to indicate where each new day began. Because of its yellow cover, this was referred to as the **Yellow "Day" Diary** Since there were fewer subcategories, this diary was only 132 pages long.

#### Prototype 3

Entitled "Your Daily Notebook," this diary was not divided into the days-of-the-week. It was an open journal format with only 4 major expenditure categories and no subcategories. Respondents recorded purchases under the correct expenditure category along with the day on which they made the purchases. Because of its teal cover, this was referred to as the **Teal "Parts" Diary** Since it lacked the repetition of the 7 days, this diary was only 36 pages long.

Through the internal review process, the peach prototype was eliminated; it was almost universally disliked because of its length and complexity. The 2 remaining prototype diaries were revised according to the comments from internal review. Copies of the yellow and teal diaries were printed and distributed to BLS and Census Bureau study participants, consisting of field interviewers, staff who process the data, researchers who use the data, managers responsible for producing the estimates, and survey methodologists. Each person was asked to keep the diary for their entire household for 1 week. Census field interviewers completed a short questionnaire developed by the Census Bureau and returned it along with comments written in the margins of their diaries. All other BLS and Census Bureau participants took part in discussion groups to talk about their experiences with the diary, identify potential problems, and brainstorm ideas for improvements.

In total, we conducted 12 discussion groups with 6 to 13 participants in each and a small group interview with 3 managers at the Census Bureau. In each of the discussion groups there was a mix of participants who kept the yellow diary with those who kept the teal diary. In this way we were able to both document participants' experiences with their assigned diaries and facilitate discussions of the relative merits of the two prototypes.

Knowledgeable BLS and Census staff members were chosen to participate in this first round of testing for many reasons. First of all, it was a way to generate interest in the new diary by disseminating

information about the proposed changes. Second, it provided BLS and Census stakeholders with an opportunity to comment on the prototypes and determine the design of the new diary. Third, it was a chance to draw upon the expertise of those who know what data the diary should collect and to critique the prototypes in light of the estimates they would produce.

### Phase 2

As soon as Phase 1 testing ended in August, 2001, work began on a fourth prototype. In response to the comments collected during Phase 1 testing, we looked at the diaries of other countries for ideas on how to reformat the final version of the diary. In particular, we liked the design of the diary from the United Kingdom (UK) because it seemed to fit all the needs described by our participants and answer their objections to each of the earlier prototypes. Consequently, we developed a new diary with a format similar to the one from the UK, but incorporating the beneficial features specified by our study participants, (e.g. Frequently Asked Questions and an introductory overview of the structure of the diary).

As in phase 1, copies of the new prototype were distributed to (a) BLS expenditure survey program managers and staff, (b) Census Field Interviewers, (c) BLS staff members who had not participated in Phase 1, and (d) members of the public. All were invited to keep the diary and respond to a review questionnaire. The BLS staff and the members of the public were also interviewed about their experiences keeping the diary. Finally, selected BLS and Census staff who had participated in the Phase 1 discussion groups, were asked to review the new prototype and try to keep it for a few days. They then participated in another discussion group to compare the new diary prototype with the earlier prototypes.

### Findings

This extended process of study and review produced an abundance of information. One of the first things we learned was that “user friendliness” can be expressed in many different ways. Likewise, we learned that it is not easy to create a diary which is at once (a) user-friendly, (b) processing-friendly, (c) sampling-friendly, and (d) data quality-friendly. In addition, 3 fundamental truths about expenditure diaries were driven home:

#### **Expenditure diary-keeping is a difficult memory task.**

1. It is often difficult to remember to record expenditures in the diary.

2. If expenditures are not recorded close to the time of purchase, they generally become increasingly difficult to report accurately.
3. If a diary is not portable, it is sometimes difficult to remember what was purchased and the price that was paid when one returns home.
4. Large quantities of groceries are almost impossible to record accurately without some memory aid, such as receipts.

#### **Reporting for other people is difficult.**

1. Family members who do not take on the task of “respondent” are less diligent about tracking their expenses and reporting them than the designated family diary keeper.
2. Other family members who do not take on the task of “respondent” may become irritated and annoyed when asked about their spending.
3. If other household members are not directly instructed by the interviewer, they are more likely to make reporting errors (e.g., reporting only those purchases made on behalf of the entire family and omitting purchases made for themselves alone).

#### **Mathematical calculations are difficult.**

1. It can be difficult to compute prices with and without sales tax, even with the aid of a receipt.
2. If receipts do not clearly specify discounted coupon amounts and sale prices, many respondents are unable to figure it out.
3. Rebates are also difficult to compute and record.

While each of the discussion groups and interviews had their own unique flavor and focus of interest, the comments made throughout were remarkably similar. Unanimity on certain key points was very reassuring and made it relatively easy to decipher the main themes conveyed in many different ways and with thousands of different words. These main themes found their fullest expression in the list of recommendations generated by participants. The recommendations seemed to be generally applicable to all diaries.

1. Diary instructions, definitions, and reporting rules should be clear and unambiguous.
2. Concrete examples should be used for the most crucial and complex cases.

3. The recording task should be simplified as much as possible and should not include a secondary data classification task, if it can be avoided.
  4. Many respondents expect diaries to be organized by day-of-week.
  5. Many respondents prefer diaries that are compact and portable.
  6. Many respondents need an overview of all the major categories at the beginning of the diary.
  7. If there are gray areas that fall outside the scope of the diary, respondents should be told in the beginning; it is burdensome to have to make decisions.
  8. When additional information is required about a purchase, it can be helpful to use checkboxes, rather than having respondents' write-in all details.
  9. A government diary should look easy and user-friendly, but still maintain a professional and official quality that separates it from marketing ploys and "junk mail."
- "Frequently Asked Questions" are added to clarify ambiguous concepts and answer the most common questions.
  - Respondents are told unambiguously in the beginning what they should not record (e.g., business expenses), eliminating the need for laborious decision-making.
  - A "mental map" of the entire diary is provided at the very beginning to explain the 5 major expenditure categories so respondents can grasp the logical structure of the diary.
  - Checkboxes are used instead of open-ended recording for all follow-up details needed for the Consumer Price Index. These include details about meal type, the type of alcohol purchase, the age and gender for clothing, and packaging for groceries.
  - Each diary day was reduced from 7 pages to 4 pages per day.

#### Next Steps

To evaluate the worth of the user-friendly prototype diary, the next step is to determine the impact upon the (a) estimates, (b) response rates, and (c) respondents' assessments of burden. What is the impact of a User-friendly Diary on estimates and response rates? Will real respondents find this diary easy to use? Will Field Representatives find the diary easier to explain when trying to enlist respondent participation? To answer these and other similar questions, a nationwide field test will be conducted in September-December, 2002. A test sample of respondents will be given the user-friendly diary with an additional test sample receiving the current production diary under comparable test conditions

#### Notes

1. For example, grocery items need to include their packaging type and whether the item is fresh or frozen. Clothing details include the gender and age range of the recipient. Meals away from home have follow-up details on alcoholic beverages.
2. The 2002 Consumer Expenditure Diary Survey has 66 pages, with a 14"x8" landscape layout. The Diary is kept for two consecutive weeks. There are 5 parts—Food Away from Home, Food at Home, Food as Gifts, and Clothing, Shoes and Jewelry. Respondents locate the appropriate part and then the correct subcategory for each of their expenses.

#### Conclusions

Totaling only 44 letter-size pages in length, the new "user-friendly" diary is much shorter and smaller than the current BLS Diary (see Exhibit 1). By eliminating the many subcategories within each major expenditure category, along with the secondary "categorization" task, each day was reduced to only 4 pages. Thus all the recording categories are clearly visible by turning only 1 page. This, in turn, reduces respondents' frustrations at having to flip through multiple pages trying to locate the appropriate place to record their purchases. Other features include the following.

- The new diary has a professional appearance with photographs and color graphics.
- Example pages are provided for each major category to show respondents the amount of detail they should record and to help them understand their diary-keeping task.
- Examples of major products and services within each category are listed on outside flaps to assist recall.

### References

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**Exhibit 1: The “User-Friendly” Diary**

SUN	MON	TUE	WED	THU	FRI	SAT	<b>Day 1</b>
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Please unfold the RIGHT FLAP to see Frequently Asked Questions

**3. Food & Drinks from Grocery and Other Stores**

	What did you buy or pay for?	How is the item packaged?		Is the item:			Total Cost without tax	Mark (X) if purchased for someone not on your list
		bottled / canned	other	fresh	frozen	other		
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