# **CE Interview Global Questions Research: BLS Conference Presentation Report**

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#### 1. BACKGROUND

In the Consumer Expenditure Interview Survey (CEIS), household respondents are asked to report on all the purchases of services and products by members of their consumer unit (CU, or household, roughly) in the past 3 months. The interview can be lengthy and burdensome for respondents given the large array of expenditures that may be made. Because respondents are often unwilling or unable to meet the demands of the survey, the CEIS underestimates consumer expenditures. The burden associated with the CEIS also limits its response rates. Thus, a potentially productive area of research for improving the CEIS data collection process lies in the development of methods to reduce the burden associated with the CEIS.

#### 1.1 Global Estimate Questions

One method for accomplishing a reduction in burden involves the use of broader expenditure questions, thereby reducing the number of questions asked of respondents. In addition, this can be combined with the collection of total, rather than individual, expenditure estimates. There are several ways in which to create these "global" questions. One way involves asking respondents to estimate the total amount of their expenditures for entire categories rather than individual expenditure items. It is important to note that these *global estimate questions* do not allow the production of CPI estimates for individual items. Another way involves asking respondent to estimate the total amount of their CU's expenditures for individual items. These *item estimate questions* might be asked for the standard 3 month reference period, or for an extended reference period (e.g., a year.) Yet another form of global questions involves asking respondents screening questions as to whether any expenditures were made for an expenditure category, and then, if an affirmative answer is reported, collecting some level of detail about those expenditures. These *global screening questions* are already in place for a number of categories in the CEIS.

The present research was conducted to develop global estimate questions (by which total expenditures estimates for broad categories of expenditures are collected.) These global

questions were developed for the collection of clothing, household equipment, furniture, recreational items, and vehicle operating expenses, Sections 6, 8, 9 and 12 of the CEIS. This report discusses the design of the questions, the methods by which the questions were developed, and various research findings concerning their use. Based on this research, a methodology and materials have been develop that can be compared to existing CEIS data collection methods in a larger scale, quantitative field test.

## 1.2 Implications for Using Global Questions in the CEIS

Global estimate questions, as described in the present report, are not intended to provide cost and descriptive information for individual expenditures. The global questions would provide data to users needing total CU expenditures. If implemented in the CEIS, this would result in the loss of information critical to CE and Consumer Price Index (CPI) estimates, and such data would need to be collected elsewhere. As originally proposed, a second diary data collection was to be implemented to meet CE and CPI data requirements for sections of the CEIS that are converted to global questions. However, a discussion of different strategies for meeting these various data needs is beyond the scope of the present research.

It is important to recognize that while the present global questions were designed with the intention of recording only total cost information, there is no reason why the global questions could not be modified to request cost and descriptive information for individual expenses identified within each global category. In fact, the research conducted on the global questions indicates that in most cases, respondents itemize their expenses and then sum these costs in deriving a total cost estimate for a global category. Individual item descriptions and their associated costs could not be recorded individually. This could still afford some time savings since the number of expenditure questions would be reduced.

#### 2. GLOBAL QUESTION ANSWERING

Attempts to reduce the length of the interview by introducing questions covering a broader range of expense items could conceivably increase the complexity of the respondent's task. There is the potential to trade-off response burden in terms of the questionnaire length for response burden in the form of question difficulty. It is important then to consider the cognitive

tasks that respondents must perform to answer global estimate questions, identify potential performance limitations, and devise way to compensate for these limitations. There are several critical cognitive tasks: category decomposition and total cost estimation.

### 2.1 Global Category Decomposition

Information in memory about expenditure events is generally not directly accessible from the identification of high level (global) categories, except perhaps when the respondent has engaged in accounting and budgeting activities involving those categories. Thus, respondents must break down (i.e., "decompose") the global category into subcategories in order to be able to search for and retrieve expenditures from memory. Decomposition is a time consuming and often unreliable process. Support from the Information Booklet is critical for assisting the respondent in the decomposition process.

Categories within taxonomies, such as the expenditure taxonomy in the CEIS, can be described in terms of their *level of abstraction* (Rosch, 1978). There are three levels of abstraction that a category may be considered to represent: superordinate (e.g., furniture), ordinate (e.g., tables), and subordinate (e.g., dining tables). Superordinate categories are the most global and encompassing, while subordinate categories are the most specific. Global estimate questions generally are designed around superordinate categories.

The level of abstraction of a category has significance for category comprehension and the retrieval from memory of events related to that category. Ordinate, or basic level categories, are most frequently and naturally used by people in the course of everyday life because they maximize the amount of information communicated (category distinctiveness) while minimizing conceptual confusion (category resemblance). In other words, most or all of the attributes of a basic level category are shared by its members, and other basic level categories share few of those attributes. For example, the basic level category "tables" is distinct from other basic level categories (e.g., "sofas", "lamps") within the "furniture" category, and the various members of the category "tables" have much in common with one another.

In contrast, subordinate categories have many attributes that are shared with other subordinate categories. For example, the attributes of the subordinate category "dining tables" are very similar to those of other types of tables. Thus, confusion between categories is more likely with subordinate categories than for basic level categories. With respect to the CEIS,

respondents may have difficulty knowing when to report their expenditures in response to subordinate level expenditure questions (e.g., portable dishwashers, built-in dishwashers). They may report some expenditures at inappropriate times and may spend time making decisions or asking the interviewer for clarification.

Superordinate level categories cannot be characterized as easily as basic level categories because their members have fewer features in common. For example, there are very few terms that characterize all the members of the superordinate category "furniture". In the context of the CEIS, or any other task where events must be recalled in response to category labels, this lack of category resemblance suggests that superordinate categories are poor recall cues. When respondents are asked to retrieve a single event, they take substantially longer to do so for a superordinate event category than a basic event category (Felcher & Calder, 1992; Reiser, Black, & Abelson, 1985). When asked to enumerate from memory all instances of a superordinate category, respondents frequently "decompose" the category into basic level subcategories in order to retrieve the episodes. Decomposition is a time consuming and often unreliable process, and survey respondents generally cannot be expected to engage in complete or detailed decomposition (Felcher & Calder, 1991).

It is important to note that although respondents would not be asked explicitly to enumerate their expenditures when they are asked to make a global category estimate, decomposition of the superordinate category is generally necessary. Respondents must identify basic level subcategories and then recall expenditure events associated with those subcategories. In order to use superordinate categories (e.g., furniture, appliances, clothing) in global estimate questions, the superordinate category must contain a limited number of basic level category members and must be a well-formed category in order for it to be reliably decomposed by respondents. However, support for global category decomposition can also be provided to respondents in the form of items lists in the Information Booklet.

#### 2.2 Total Cost Estimation

In global estimate questions, respondents must provide an estimate of the total cost of their expenditures for each global category. In some cases, they may be able to provide summary amounts of their expenses directly from memory, but more often than not, they must recall individual expenditures in a global category and sum their costs. This addition process is

slow and difficult for respondents. Placing responsibility for the addition of enumerated expenditures in the hands of survey field representatives (FRs) is critical to the design of global questions that are not unduly burdensome to respondents, and for reducing addition errors.

Much like the estimation of the frequency of certain behaviors (e.g., Blair & Burton, 1987), the estimation of the total amount of money expended across multiple expenditure events may involve one of several different response strategies. Respondents may enumerate the various expenditures they have made and add these expenditures together to arrive at a total amount. Such estimates are likely to be best when the expenditures are infrequent so that the addition of the expenditure amounts is not overwhelming to respondents. Alternatively, respondents may make inferences or judgments concerning the rate and usual amount of the expenditures. The frequency of the expenditure is then multiplied by the usual amount. Such inferences are likely to be most valid and reliable when the expenditures event occur at regular intervals and at a cost that is consistent across time. Finally, respondents may be able to directly retrieve the amount expended over multiple expenditures. This may be possible when all the items were purchased in a single shopping trip, or when the respondent has engaged in accounting or budgeting activities using expense categories that mirror the global questions. For example, a respondent may keep track of the amount spent on clothing each month, or set a monthly budget limit for themselves for a given activity such as gardening. Respondents may also retrieve total expenditures for certain types of items such as regular billing payments. For such items, a total annual or semi-annual amount owed is provided to the respondent by the establishment receiving the payment.

#### 3. DEVELOPMENTAL RESEARCH METHODS

Based on the cognitive analysis of the respondent's task discussed above, global estimate questions should be designed so that employ familiar and meaningful categories for respondents so that items within the category can be identified readily. Some attempt may be made to employ categories that are likely also to be used in budgeting and accounting activities, or where the expenses for the different items in the category are likely to occur in the same shopping trip. Support for category comprehension and expenditure recall should be provided through items

lists in the Information Booklet. Providing FR assistance for summing of recalled expenses will relieve respondent burden and has the potential to reduce error.

A three phase cognitive interview research approach was employed to inform the design of the global methods, questions, and respondent aids. In addition to these cognitive interview methods, several other exploratory investigative techniques were used. The methodologies used in developing the global questions are described next.

# 3.1 Card Sorting

A preliminary cognitive interview method for identifying expense categories and category labels is to have research participants organize expense items into categories. This task was administered to several groups of about 8 to 12 research subjects in developing global categories for different domains of the CEIS. In the task, subjects are provided with cards containing the names of individual expenditure items (largely taken from the CEIS questionnaire and Information Booklet). Subjects are asked to sort the cards freely into as many categories as necessary, and to write a label for each category they form. After completing this first round of sorting, participants who create very large categories of items are asked to break these groups into subcategories. This is useful for examining the full categorical structure of the items, and because the respondent may have created an unreasonably large category that is ill-defined. Similarly, participants who create relatively small categories of items are asked to combine these categories to form broader groupings. A cluster analysis can be used to derive a categorical structure for the expenditures (Brewer, Dull, & Jobe, 1989).

The card sorting task provide information on whether the categories are sufficiently well-formed for use as global, superordinate categories. They also provide information to suggest whether a categorical structure different than is currently employed for the CEIS is warranted. Though this method does not necessarily reveal the way that expenditure events are organized in memory, it does tend to reveal a semantic structure that is based on the functions (i.e., uses) of the products and services. To the extent that, items of a similar function will be purchased together, purchased in association with the same types of events, or located in the same room of a house, retrieval searches for these items within a category may be made more efficient.

Another version of the card sorting task that was used in the development of the global questions was to provided subjects with cards containing CEIS section labels along with cards

containing individual expenditure items. Subjects are asked to sort the items into the categories provided. This method, unlike the free-sorting task described above provide an idea of how the current organization of the CEIS deviates from the way that respondents naturally conceive of these categories. It provides a means for identifying useful, albeit less dramatic, restructuring of CEIS expenditure items without altering the general categories that are used.

# 3.2 Category Decomposition & Attribute Listing

Once preliminary categories are designed based on information from the card sorting method, an effective method for testing the comprehension of the categories is to ask research participants to decompose them by listing items they believe belong in the categories. This task was administered with several groups of about 8 to 12 research subjects in developing global categories for different domains of the CEIS. By examining the items that are listed and the ease by which respondents can identify these items, the method provides valuable information on whether category labels are understood as intended, whether the categories are well-formed and meaningful, and what items require emphasis in Information Booklet cue lists. The method has also led to the identification of many items to be listed in the Information Booklet.

Research participants in the decomposition tasks conducted in the present research were also asked to list as many attributes (e.g., physical characteristics, product uses) as possible for each proposed global category as well as subcategories. By examining the number of attributes listed, the level of abstraction of the categories can be ascertained. Relatively few attributes are generated for superordinate categories, while an equal number are generated for basic level and subordinate level categories (e.g., Rosch, Mervis, Gray, Johnson, & Boyes-Braem, 1976). In addition, this method provides some valuable ideas for terms to be used in the global category labels.

# 3.3 Global Estimate Reporting

Once global categories have been refined using the decomposition task, Information Booklet materials need to be created so the global questions can be tested. The third research phase involves a "dry run" through the global questions with concurrent and retrospective thinkaloud cognitive interviewing methods. Research participants are asked to think aloud about, or report on, the memory search strategies they use to recall expenditures, and identify how they arrive at the total or subtotal cost estimates when they are offered (e.g., multiple items purchased

on a shopping trip). An additional goal of the method is to get input on the global categories and the item lists in the Information Booklet, including whether the inclusion of items in each global category makes sense and whether there are additional items to include in the lists for a category. This task has been administered with several groups of about 8 to 12 research subjects in developing global categories for different domains of the CEIS.

One variant of this method that has been employed in the present research has been to ask participants to estimate the total amount of their expenditures for each global category prior to asking for an estimates based on support from the Information Booklet. Other participants were shown the Information Booklet and asked to make a quick estimate of the total amount "off the top of their head" before providing a more considered estimate. Because a more thorough estimate is requested eventually, the procedures described above may still be used. The former version, provides rich memory search strategy information since respondents are asked to provide estimates without the aid of the Information Booklet. It also provides information about respondent decomposition of the categories in the context of providing expenditure estimates (as opposed to explicit instructions to decompose the categories). Both of these methods permit some consideration of whether or not respondents readily have total estimates for their global category expenditures or can provide general impression estimates that are reasonably accurate. The findings of the present research are that such quick estimates are not typically easy for respondents to produce.

# 3.4 Additional Investigative Techniques

To supplement the information collected in cognitive interviews, several other exploratory investigative techniques were used. This has included

- examination of the current CEIS questionnaire and Information Booklet,
- economic research into expenditures reported in the CEIS and CE Diary Survey,
- investigation of products and services identified in the Consumer Price Index survey,
- investigation of product and service categories and items on commercial Web sites and in commercial retail centers, and
- brainstorming by individuals involved in the research.

Obtaining feedback on the global questions from actual interviewers is also desirable. In 1995, the BLS conducted mock interviews with FRs using the global questions developed for

Sections 6, 8 and 9 of the CEIS. Feedback was obtained from the FRs on the global questions, forms, and methodology. Some minor adjustments were made to the global question materials, but overall FR reactions were very favorable.

#### 4. DESIGN OF THE GLOBAL QUESTIONS

The design of global estimate questions for the CEIS involved developing global categories, the questions and instructions, procedures to support the summation of expenditure costs, an questionnaire form, and an ordering for the global questions. The principals by which these materials and procedures were developed are discussed below. The development of the Information Booklet cues is discussed in Section 5.

# 4.1 Global Categories

In most cases, the category labels developed for the global categories have proven to be sufficiently informative for respondents to reliably understand the intended set of products. While these categories have required some work to develop, the creation of global categories has been feasible (see the Appendix for a listing of the global categories for Sections 6, 8, 9, and 12). Nevertheless, we believe that Information Booklet cues are necessary to support comprehension and decomposition.

The construction of the global categories was driven by the general principle that for both the purposes of comprehension as well as recall, it is best to categorize items according to their function or use and their location in the home. Minimal consideration was given to similarities in the physical form of the items (e.g., all appliances). The results of cognitive interview studies conducted as part of the present research have strongly supported this approach, as have previous cognitive interview studies (Lessler, 1989). This approach is also supported by general findings in cognitive research literature demonstrating autobiographical memories are organized according to the activities in which a person engages (Barsalou, 1988; Conway & Berkerian, 1987; Reiser, Black, & Abelson, 1985; Robinson, 1976).

Recall strategies reported by respondents in the present research have consistently shown that respondents retrieve their expenditures in the context of reasons for these purchases. This includes household activities (e.g., a child's participation in soccer), events associated with the

purchases (e.g., a Christmas gift), and needs for the purchases (e.g., a TV was no longer functioning).

Another effective recall strategy is to recall shopping trips (again, an activity). While it is not always the case that items related by function or use are purchased on the same shopping trip, most retail centers offer products and services that are related in function. Thus, a respondent may buy multiple items at a store, but in many cases they will be related according to their use. Thus, items that are purchased together frequently come from the same global category when the categories are organized according to their function or use. In some cases, the respondent may remember the total price they paid at the check-out counter, making the reporting of these purchases extremely efficient.

Recall is also sometimes based on locations within the home. This occurs because some locations (e.g., kitchen) are closely associated with certain activities, and products are stored and used these locations. Alternatively, visualizing a room and the items located within the room is sometime useful for identifying newly purchased items.

An important consideration in developing the categories has been to ensure that the frequency of expenditures does not preclude accurate total cost estimation. In particular, it is likely that respondents' ability to make accurate total cost estimates, or enumerate their expenses for a broad category, will be affected by the number of expenditures made by their CU. To an extent, the global categories have been devised with consideration to information gathered on the frequency of expenditures for the categories, and on observations of the ability of respondents to report their expenses for global categories. Of course, combining and separating categories of items on this basis must be done to create new categories that are meaningful and natural for respondents.

There have been a number of difficult decisions made in the course of developing the global categories. For example, one important issue has been how to categories clothing (e.g., shirts, pants, and dresses), shoes, hosiery, clothing accessories (e.g., belts, ties, hats, gloves, scarves), and personal accessories (e.g., purses, sunglasses, watches, jewelry, and umbrellas). Men and women think of these items in different ways. Men tend to treat ties and belts as clothing, but many women consider "accessorizing" a distinct activity. Most men consider socks to be clothing, but many women also consider hosiery to be an accessory. In department stores,

women's clothing accessories and hosiery are located nearby the personal accessories. Since regular clothing purchases are made very frequently, it may be inadvisable to include all of these items in the same global category even though they are related. The question becomes how to divide them up meaningfully. Asking about men's clothing and women's clothing separately seems sensible, but it does create a lot of redundancy in the Information Booklet cue lists.

Another significant example relates to the overlap between furniture and equipment purchased for use in and around the home and for use with vehicles. For example, furniture and appliances are purchased for use with many boats and recreational vehicles. There are numerous similar issues. Should pet barriers for automobiles be included with vehicle accessories or with pet equipment? Should car stereos be included with household audio equipment or with vehicle electronic equipment or with vehicle accessories? Are driving gloves a clothing expense or a vehicle expense? Are bike racks a sports equipment expense or a vehicle expense? Cognitive interviews suggest that in many cases household and vehicle items in many cases can be combined in a way that research participants find quite natural, but that it is also quite natural for people to think of their homes and vehicles as a separate domains of activity. Practical considerations also play into the decisions that are made: if overlapping vehicle accessories are combined with household items, then it becomes difficult to devise meaningful categories for non-overlapping vehicle accessories that do not also include the overlapping items.

#### 4.2 Question Form and Instructions

The global questions were designed to ask whether expenditures were made in a category since the beginning of the reference period, and then to ask for the total amount that was spent. Figure 1 shows a mock up of several proposed CEIS global questions.

General instructions for the global questions are given in advance of the start of the questions, and are repeated after every twelve questions (this is not a strict commitment). Respondents are instructed to report both purchases and rentals for the CU or as gifts, including sales tax and delivery and installation charges. The delivery and installation charges instruction is also included in the Information Booklet section for appropriate categories. The reference period is repeated for the respondents in every fourth question starting with the first question. Instructions for excluding business expenses from computer equipment and office equipment are integrated into the questions for these categories.

The present research has shown that only under very select circumstances were subjects able to provide total expense estimates for the global categories. This is possible when, for example, a person has a budgeted amount that they spend or when a person has purchased a number of items together. In general, however, subjects enumerate their expenditures and add these expenses to reach a total. Total cost estimates based on the addition of individual item costs were clearly susceptible to respondent calculation errors. Previous research by Lessler (1989) using current CEIS questions indicated that respondents sometimes become confused about whether they had already reported an expenditure.

For these reason, the global questions were design to place responsibility for summing the enumerated expenses on the FRs. An open vertical workspace is provided for FRs to make notes on the enumerated expenses for each global category. The particulars of how to use of the workspace are left up to the individual FRs. It may be useful to investigate further how FRs best make use of the workspace to take notes on enumerated expenses. Such information might be useful for creating training materials.

**Figure 1.** Mockup of a several proposed CEIS global questions.

1a.	Information booklet page xx  Since the 1st of (month, 3 months ago), excluding (this month), has your CU had expenses for clothing or shoes?	1□ Yes 2□ No - go to 2a	WORKSPACE
b.	What was the total amount spent?	\$00	
2a.	Information booklet page xx Has your CU had expenses for jewelry or other personal accessories?	1□ Yes 2□ No - go to 3a	
b.	What was the total amount spent?	\$00	

#### 4.3 Question Order

An important task in developing the global questions has been to devise an order for the presentation of the global categories in the interview. The most important factor dictating the order was the conceptual flow of the categories. The order of the categories was largely determined from evidence about the conceptual similarity of the categories gathered in the card-

sorting methodology. A cluster analysis of this data provided provides evidence of several general dimensions for the global categories for CEIS Sections 6, 8, and 9. These general groupings include leisure/recreation items, household furniture and equipment, and clothing and personal items.

The ordering work also considered similarities in the nature of the search strategies subjects employ to recall expenditures for different categories (e.g., recalling expenditures by shopping trips, by recalling rooms, by recalling activities, etc.). In addition, efforts were made to avoid reporting problems associated with category overlap in which items are reported prematurely for an unintended category. Finally, some consideration was given to lower income households by asking about common items such as clothing at the beginning of the interview.

#### 5. DESIGN OF THE GLOBALS INFORMATION BOOKLET

A major focus of the present research has been to develop Information Booklet cues to support global question answering. The design of the booklet takes on special importance with the global questions because they involve much broader categories than current CEIS questions. The Information Booklet cues are critical to respondent comprehension and decomposition of the global categories. Moreover, global question cue lists are likely to be lengthier than the typical CEIS question cue list. Reviewing these lists may be time-consuming, and the likelihood of respondents missing items increases with the length of the list. To address these concerns, the present research examined how respondents use for Information Booklet and how the booklet design can be improved for use with the global questions.

One of the primary issues addressed in the design of the Information Booklet concerned the general strategy for cueing respondents with lists of expense items. For example, this involves decisions about whether to provide a limited example items or relatively complete lists of items. It is also critical to format the Information Booklet in a way that permits respondents to review the items lists efficiently. The general design recommendations presented here are intended specifically for an Information Booklet used with global questions. It is likely that many of the same principles apply for Information Booklet materials used with other CEIS questions, but that has not been fully examined.

# 5.1 Expense Item Lists

The current CEIS Information Booklet contains relatively incomplete lists of expenditure items that are provided as examples for the categories. Full comprehension of the global categories may be difficult to achieve when subjects are provided with only a limited set of cues. In addition, the existence of a memory phenomena referred "part-set cueing" effect (e.g., Nickerson, 1984; Roediger & Neely, 1982) suggests that providing partial cues lists of exemplars may not be an optimal approach for reminding respondents of their expenses. When people are offered a partial list of items that they are asked to remember, they do no better in remembering the remaining items than those who were provided no cues, and typically do worse. A strategy of listing key examples in the Information Booklet may therefore reduce, or inhibit, the ability of respondents to recall other expenditures that are unlisted. The research suggests instead that Information Booklet should contain relatively complete lists of items for each global category.

The Information Booklet cues lists for the global questions were designed to include the exemplars for each category and numerous less typical items. These cues were drawn from a variety of sources including the current CEIS Information Booklet, economic research into expenditures reported in the CEIS and CE Diary Survey, the investigation of commercial retail Web sites and stores, items listed by respondents during the "decomposition" task research, expenditures reported by subjects in cognitive interviews, subcategories generated by subjects in the product categorization and category decomposition task studies, and brainstorming by individuals involved in the research.

Complete lists are, however, an a near impossibility. For example, new products and services are constantly emerging. But, even more importantly, the miscellaneous parts, supplies, and accessories for many expense items are too numerous to list. Yet, one of the clear and repeated findings in cognitive interviews is that some research participants tend to take the Information Booklet lists to be literal and complete lists of the to-be-reported items. Others simply don't make the effort to "think beyond" the literal lists. It is therefore recommended that respondents be encouraged to treat the item lists as suggestive of the types of items to be reported, and include closely related items. This encouragement also benefits the interview because respondents occasionally miss an expense item on the lists. When encouraged to think of unlisted items, respondents will sometimes ask for help in located a missed item on the lists,

or identify their expenses for the listed item in advance of finding it on the lists. This additional advantage was observed in the cognitive interviews.

Instructions to "think beyond" the lists need to be tempered, however. The lists developed in the present research are relatively complete, and strong instructions can lead respondents to go beyond the boundaries of the category in recalling their expenditures. This was a common finding in cognitive interviews in which participants were asked to identify additional items that might be included on the lists for each category. However, respondents may often ask if they should include an expense for an item that is not listed, and should be encouraged by the FRs to do so. FRs should be trained to inform the respondent that an expense should be reported in a subsequent category.

Several adaptations to the Information Booklet and the instructions provided to respondents at the beginning of the globals can assist in encouraging respondents to consider closely related but unlisted items in the category. Several recommended changes are as follows:

References to the lists. The current CEIS Information Booklet presents each expenditure category followed by the words "such as" and a list of items. Cognitive interview respondents report not really hearing, seeing or paying attention to the words "such as." It is recommended that the text "such as" be replaced with the word "Examples" in a large font. In addition, FRs should be encouraged to commonly refer to the lists as "examples."

<u>Instructions on using the booklet</u>. A brief statement has been added to the instructions at the beginning of the global questions to encourage respondent to consider the lists to be examples. Currently, FRs are instructed to "Hand the respondent the Information Booklet with instructions to look at the item lists as you proceed." It is recommended that this statement be modified to include the following:

"Hand the respondent the Information Booklet with instructions to look at the item lists as you proceed. Tell the respondent that the item lists provide examples and that they should also report expenses for other closely related items."

<u>Follow-up Probe Questions</u>. One technique that has appeared to be successful in the cognitive interviewing is to ask respondents whether they had expenses for any other closely related items not listed when they had completed a search of a list. A recommended phrasing for

the probe question is: "Were there any other expenses for items closely related to these?" This probing is primarily recommended for larger categories such as "tools and hardware supplies", "cooking, serving and dining wares", and "sports and exercise equipment and supplies." The probe can be added to the global questions for these categories. Generally, such a probe will encourage respondents to ask whether their reports are appropriate for the category.

# 5.2 Alternative Cueing Strategies

Use of the Information Booklet encourages respondents to rely heavily on the listed items as reminders for their expenditures (as opposed to conducting self-directed memory searches.) Fortunately, the cue lists provide strong reminders for respondents. In cognitive interviews where respondents were asked to search their memory for additional expenses that they did not recall while reviewing the lists, few reports were typically elicited.

Sole reliance on the Information Booklet for cueing may be limiting, however, if the item lists are incomplete. The present research examined the idea of providing additional aids that support the use of effective self-directed memory search strategies. An attempt was made to suggest effective retrieval strategies to respondents. For example, this included reminding respondents to think of different rooms in the home when recalling furniture expenses.

The idea of providing supplemental aids suggesting effective recall strategies was examined in interviews with 9 participants. The supplemental aids (see Figure 2) were developed based on the typical recall strategies identified in cognitive interview sessions with other participants. In these earlier sessions, respondent were asked recall their expenses without the aid of the Information Booklet, and report their recall strategies for each global category. The recall aids were positioned below the item lists for a number of large categories.

**Figure 2.** Example of a supplement recall aid for a global question on clothing.

**→** THINK ABOUT: different household members

shopping trips & stores

activities such as work, school, recreation special occasions and gifts purchased

weather-related purchases

Six of the nine participants indicated that they paid little attention to the supplemental aids. The other three read the aids, but indicated that they offered no additional assistance over what they had already done in. The reports of all participants indicated that recalling expenditures based on picking out items from the cue lists was by no means a passive memory process. Their comments suggest that reviewing the lists involves considering what items and subcategories of items are relevant to the respondent. Sometime this can be done automatically without much conscious thought, but in many other cases it involves actively comparing the items and their use with autobiographical information in memory concerning recent activities, needs, and shopping trips of household members. The findings suggest that there may be little value provided by these additional recall strategy aids.

# 5.3 Design and Formatting for Efficient Review

The items list for global questions are lengthier than for most current CEIS questions. One reason is that the global questions by definition involve broad categories of expenditures. Another reason is the recommended approach of providing relatively complete lists of expenditure items. Given their length, a critical issue is how to ensure that respondents can review the lists efficiently and without missing items. The present research sought to facilitate use of the lists through their formatting. As a result of the research, a number of innovations were made to the design of Information Booklet for the global questions. The majority of these design changes were made explicitly for use with the global questions, and while they are not necessarily recommended for more general use in the CEIS, they may apply.

Font. There are simple font changes to the current CEIS Information Booklet that that may assist respondents in reviewing the item lists. For example, research has shown that words that are printed in all uppercase letters are more difficult to read than those printed in lowercase or mixed case letters (Poulton, 1967; 1968; Tinker, 1965). Upper case letters have a uniform height and, as a result, the word forms are less distinctive. Yet, most of the existing CEIS materials are constructed with category labels printed in uppercase wording. It is recommended that category and subcategory headers be bolded and placed in a slightly larger font for emphasis. Major category headers may also be boxed or shaded for additional effect.

<u>Subcategorization</u>. One extremely important design feature is the organization of the extensive global category cue lists into labeled subcategory groups. Unlike the current

Information Booklet, the approach that has been adopted for the global categories involves two levels of cues. Lists of individual expenditure items are provided under the subcategories that comprise each global category. These subcategories were designed to represent as much as possible different uses for the items or activities involving the items. For example, the global category "Safety and Security Equipment" can be subcategorized into groups such as "anti-theft", personal security", and "fire safety." Thus, the subcategory structure was designed based on the premise that recall is activity-based, as supported by the present cognitive interview studies and the cognitive research literature.

In early work on the global questions, a number of "other" subcategories were created. The current CEIS Information Booklet also contains such categories. With some effort, these miscellaneous item grouping were eliminated from the recent Information Booklet materials for the global questions. This kind of grouping fails to take advantage of the opportunity to use conceptual subcategory groupings to facilitate their reading and comprehension.

All research participants (N = 27) using global category items lists organized in this way responded favorably to these subcategory labels and indicated that they helped add coherence to the presentation of lengthy lists of items. They also indicated that groups of items were more easily understand and could be read more quickly because of the context provided by the subcategory labels. Finally, they indicated that the subcategory labels permitted the respondent to skip groups of items when they were not relevant. In many cases, respondents would read the label and then more quickly peruse the items (or a subset of the items) rather than skipping the group entirely. Nevertheless, some facilitation in the review was clearly afforded.

Item Ordering. Another change to the format of the Information Booklet was to cease using an alphabetical ordering for the listed items. Instead the recommended approach is to list items according to the size of their expense and the frequency by which they are purchased. In some cases it is useful to emphasize certain items that are less typical of the category and are less likely to be thought of when the global category is mentioned. Even with the constraint of these important factors, there is nothing particularly systematic about the recommended approach. It is important to be deliberate in formulating the ordering.

In cognitive interviews, a useful practice appeared to be to probe on certain common and important items to make sure that the respondent noticed their presence For example, for the

global category "clothing" it may be effective to probe whether the respondent has had any shoe purchases. For "TV and Video Equipment and Supplies" it may be effective to ask whether any movie videos have been rented. It should be possible to train or encourage FRs to engage in such probing, especially as they become familiar with the categories and response patterns. This may also lead to some biases in the way that data is collected, but these may be no worse than biases that are introduced by the ordering of items in the Information Booklet. Ultimately, the success of the method relies on the thoroughness of respondents in reviewing the item lists.

<u>Use of a Column Format.</u> The Information Booklet for the global questions was first designed with the subcategory labels listed on the left hand side and three columns of items to the right (see Figure 3). The goal of this design (Design A) was to allow respondents to review the subcategory labels quickly, and refer only to the items that are relevant.

**Figure 3.** Horizontal layout for global question cues in Information Booklet (Design A)

4.	LUGGAGE, CASES, AND STORAGE such as:					
	TRAVEL ITEMS	suitcases	luggage carriers	toiletry bags		
	DAILY USE	attaché cases	lunch boxes	fanny pack		
	STORAGE	closet organizers garment bags	clothes hangers tie racks	under-the-bed boxes		

Cognitive interviews were conducted with 9 participants who were asked to "trace" their scanning eye movements as they were reviewing the lists. They were also asked to describe how they were reviewing the lists. Finally they were asked about their impressions of the formatting. The following observations were made:

- 6 of 9 participants were observed and reported scanning haphazardly through the lists, or by cutting across subcategories of item downwards through the columns;
- 5 of 9 participants said they ignored or paid little attention to the middle level categories; and
- 9 of 9 participants reported that the lists looked cluttered and disorganized.

One problem with the design that clearly contributes to these observations is that the spacing between the items in different subcategories was not sufficient to encourage respondents to review each subcategory before moving to the next. Another problem is that the subcategory headers are out of the main path that is followed by respondents who are reviewing the items.

In response to these findings and based in part on the ideas provided by two research participants, two new designs for the Information Booklet were created and tested with the following group of cognitive interview participants. One design (Design B) was an attempt at improving the previous design by adding alternating shading to separate the subcategory groups of items. Uppercase words were also changed to lowercase. This design is show in Figure 4.

**Figure 4.** Revised layout for Information Booklet cues (Design B)

4. Luggage, cases, and storage (examples)					
Travel	suitcases	luggage carriers	toiletry bags		
Daily use	attaché cases	lunch boxes	fanny pack		
Storage	closet organizers tie racks	clothes hangers garment bags	under-the-bed boxes		

The second design was created with the idea of placing the items from each subcategory into a column, and putting the subcategory label at the top of the column where it would be seen as respondents reviewed the item lists (see Figure 5).

**Figure 5.** New design layout for Information Booklet cues (Design C).

# 4. Luggage, cases, or storage (examples)

Travel	Daily use	Storage
suitcases	attaché cases	closet organizers
luggage carriers	lunch boxes	garment bags
toiletry bags	fanny packs	clothes hangers
		tie racks
		under-the-bed boxes

In 15 cognitive interviews, participants were asked to compare the three designs and chose between them. The procedure varied slightly. Five participants used the first design to answer the global question about clothing, and then were asked which of the two designs they preferred. Another five participants used the second design to answer a global question about clothing, and then were asked for their design preference. The remaining five participants were asked for their preference before they. The results were overwhelming: only two participants indicated that they preferred Design B over Design C and A. One of two participants who preferred Design B made the excellent point that reading left to right is more natural than reading down a column. The other preferred Design B because of the ability to quickly scan the subcategory headers.

Overall, however, participants reported that Design C looked significantly less disorganized. In addition, participants indicated that the lists in Design C were much easy to review and that the subcategory headers were easier to see and more useful in Design C. This formatting was used in 18 cognitive interviews and in all interviews, participants were observed to scan the lists in an orderly manner one subcategory column at a time. To the researcher, there appeared to be a significantly reduced risk of missing items.

The Information Booklet material for the global questions were reformatted according to this Design C, and it was determined that very little additional space was required for this design over the original Design A even with the addition of considerable numbers of items, and that considerably less space was required in comparison to Design B with the same number of items listed.

#### 6. DOMAIN OF THE GLOBAL QUESTIONS

The development of global questions for the CEIS has thus far included Sections 6, 8, 9 and 12. Expenditures collected in these sections include apparel, furniture, household equipment, recreational equipment, and vehicle operating expenses. The selection of these sections was motivated in part because the collection of this data in detail is time consuming and tedious in the current CEIS. Moreover, many of the common household items in these sections are readily organized into superordinate categories, making these sections especially suitable for

the development of global questions. Numerous related items collected in other CEIS sections were also included in the global questions when appropriate and feasible

# 6.1 Types of Expenses Collected

The global questions are designed to collect the total expenses for a CU over a three month reference period for various mid- to large-size categories of products and services. In some cases smaller supplies are also included. Other than total expense, there are no attributes collected for the expenditures. Thus, the data collected in the global questions cannot be used for estimation in either the CE or CPI, but will contribute to meeting the needs of data users who are interested in total expenses for a CU. Total expenses for a CU does not include business expenses. Total expenses for these categories does include:

- expenses for the purchase and rental of products, or for the purchase of services;
- expenses for members of the CU or as gifts for persons outside of the CU;
- sales tax;
- delivery and installation charges.

The decision to have respondents include sales task was made based on an examination of data from the current CEIS on whether or not people tend to include sales tax in their reports when given the choice whether or not to include the tax. Table 1 provides a breakdown percentages of reports in the CE Interview Survey, Sections 6, 8 (Part A only), and 9 with respect to the inclusion of sales tax. For each estimate reported in these sections, respondents are asked whether or not sales tax was included. The counts provided in the table are for reports made in four collection quarters (CEIS numbers 931-934). The percentages indicate that there is a rough balance between those who include and those who exclude sales tax, although the percentages favor inclusion. The clothing section (Section 9, Parts A and B), is the only section where the number of reports including sales tax does not exceed reports excluding sales tax. This is very likely due to the fact that sales tax was not charged for clothing items in certain states and locales.

Table	1.	The vol	luntary	inclusio	on of sa	ıles tax	in (	CEIS	collection	quarters	931-934.

Section/Part	Percentage of reports that include sales tax	Percentage of reports that do not include sales tax
6A - Household Appliances	64	36
6B - Small Household Appliances, Equipment	57	43
8A – Furniture	54	46
9A - Clothing for Non-infants	42	58
9B - Clothing for Infants	45	55
9C - Sewing Materials	51	49
9D - Clothing Services	57	43

It is therefore recommended that respondents should be asked to include sales tax in the global questions. It is important to recognize that in addition to the respondents who provide this information voluntarily, some respondents who might choose not to include sales tax are likely to be able to provide this information if it is specifically requested.

# 6.2 Enhancements to the Expenditures Collected

The original domain of the global questions included the items collected in Section 6, 8, and 9. Early research on the global questions suggested that that there were some limitations in the current CEIS questions in the collection of recreational items, furniture, and household equipment:

- The collection of household equipment and furniture in CEIS Sections 6 & 8 may be limited by the lack of explicit mention of a number of categories.
- Many popular items from existing categories in Sections 6, 8, and 9 are not found in the Information Booklet.
- The collection of non-electric household equipment and equipment accessories in Sections 6 and 8 is inconsistent, varying by category.
- The collection of supplies and replacement parts in Section 6 and 8 may be inconsistent.

The strongest evidence of these gaps in the CEIS collection is the existence of Diary-only UCCs containing items that are closely related to the items collected in Sections 6 and 8. Data mapped to these UCCs is not expected to be captured in the CEIS. The following is a list of these Diary-only UCCs:

**Table 2.** Diary only UCCs as evidence for gaps in the CEIS data collection.

UCC	Description	Examples
300900	Misc. Household Appliances	trash compactor, icemaker, battery charger, shower massager, steam cleaner, air purifier
320140	Laundry and Cleaning Equipment	clothes pins, brooms, ironing board & cover, food brush, toilet brush & stand, laundry bag
320380	Tableware/Non-electric Kitchenware	trivets, napkin holders, plastic table cloth, gift tins, kitchen scissors, spatula, dishpan, cookie jar, cutting board, ice cube trays, steak knives, roll basket, mugs
320430	Other Hardware	ladders, rope, shelves, sheds, curtain rods
320610	Misc. Supplies and Equipment	nails, mailbox, metal cabinet, carpet knife, drill bits, work bench, tool chest, padlocks, hooks, keys, caulk, utility gloves
320905	Misc. Household Equip./Parts	appliance parts, electronic parts, lawn mower blades, filters, sewing machine parts
330510	Misc. Household Products	disposable plastic & paper dinnerware, staples, pool supplies, pool parts, rug shampoo, plastic tarps, batteries
330610	Lawn and Garden Supplies	flower bulbs, plant foot, mulch
660000	School Supplies	book bags, ruler, globe, note books, compass, atlas, school equipment.
620913	Pinball, electronic video games	arcade games, arcade tokens, pinball

As a result of this investigation, an attempt was made to design the global categories and Information Booklet cues to more carefully encompass the intended domain of Sections 6, 8, & 9. In many cases this was a simple matter of making items to-be-reported for explicitly to respondents by including them in the Information Booklet. In other cases it required the addition of entire new subcategories of items. Most of the items from the related Diary-only UCCs were incorporated in the global questions domain. Other items such as Souvenirs (610902), and Fireworks (610901) for example, are not currently covered in the interview survey, but have less of a conceptual relationship to the global questions developed thus far for the CEIS.

# 6.3 Expansion To Other Interview Sections

The development of the global questions provided an opportunity to streamline the interview by including highly related items from sections of the interview other than those primarily targeted for conversion to global questions. An additional benefit of expanding the domain is a reduction in the risks of redundancy in the interview, which can lead to duplicate reporting. Obviously the inclusion of these items in the global question domain requires that detail be collected elsewhere for the purposes of the CE and CPI. Originally, these expansion of the global questions beyond Sections 6, 8 and 9 was possible because a corresponding expansion was planned for the BLS's second diary instrument due to the relatedness of the items.

In addition to the closely related items, a small set of other items were moved from Section 19 into the global questions because it made little sense to leave one or two product categories in Section 19 when all other items in the section are services. Finally, two items were moved from Section 20 Part B to the global questions. These items collect total expenses in the three month reference period for coin-operated laundry and for dry cleaning. The form of these questions matches that of the global questions and the items fit well with other clothing services such as clothing storage, clothing alteration and repair, and watch and jewelry repair and cleaning.

**Table 3.** Items from non-targeted sections that were incorporated into the global questions

<u>Item</u>	<b>Current Section</b>
310341 CDs, tapes, & videos from mail-order club	os 17A
310342 Records, CDs, tapes, & needles	17B
610210 Photographic film	17B
310220 Video cassettes, tapes, & discs	17B
620912 Rental videos, tapes, etc.	17B
620330 Film processing	17B
620410 Pet services	19
320903 Fresh flowers and potted plants	19
310230 Video game hardware and software	19
610110 Toys, games, tricycles, hobbies	19
610320 Pet purchase, supplies, medicine	19
340520 Laundry and dry cleaninghh textiles	20B
340530 Coin-operated laundry hh textiles	20B
440120 Coin-operated laundryclothing	20B
440210 Dry cleaners or laundry clothing	20B

There are a number of service items that have not been incorporated into the global questions. Several items are closely related with global categories. For example, several cognitive interview participants reported or asked about reporting "fees for participant sports" in "Sports and Exercise Equipment." This is less likely to occur in an actual CEIS interview since Section 17 would appear prior to the global questions.

**Table 3.** Related items from non-targeted sections not included in the global questions.

<u>Item</u>		<b>Current Section</b>
	Cable TV service	4
	Telephone service	4
	Household equipment repairs	7 (entire section)
	Automobile or other vehicle insurance	13
620310	Fees for recreation lessons	16A
620221	Admissions to sports events	17A,B
620211	Movie, theater, opera, ballet	17A,B
620121	Fees for participant sports	17A,B
	Home security service	19
	Computer information services	19
800803	Gambling	19
	Public phone service	20
	Taxi and limousine fares	20
	Mass transportation fares	<u> 20</u>

#### 6.4 Location of the Global Questions in the CEIS

It is recommended that the global questions be located at or near the end of the interview. Placing the global questions toward the end of the survey will help to ensure that items collected in other sections are not reported in response to the global questions. It may also help to increase the quality of data collected from other sections because these sections will be asked earlier in the interview. Finally, it would seem appropriate to located the global questions near Section 20 (and 17) which already contain some total expense questions. It appears appropriate to create a new section between Section 20 and 21.

### 6.5 Implications For Other Interview Sections

The recommendation to locate the global questions toward the end of the interview survey means that questions in Section 7 about repairs and service contracts for household equipment are asked without the benefit of first going through the purchase of household equipment in Section 6. The Information Booklet pages for Section 7 should be enhanced to provide additional cues so that Section 7 may stand alone. The changes necessary to address possible problems are not expected to be substantial.

In addition, the decision to ask about expenditures for items from sections other than 6, 8 & 9 means that certain changes need to be made to these other sections. That is, a number of questions that need to be removed from sections 17, 19, and 20 because these questions have been incorporated into the global questions. If the globals are implemented as proposed, Section 19 will collect expenses for services only. Therefore, Section 19 might be changed from "Miscellaneous Expenses" to "Miscellaneous Services". It seems reasonable to conduct research into expanding and developing this section by considering additional services that can be collected.

#### 7. Future Research

The primary reason for developing the global questions was to relieve some of the burden of the CEIS. There are a number of different ways in which time savings are achieved through the use of the global questions as compared with the current interview questions. First, there are more than 50% fewer global questions than there are expenditure questions for Sections 6, 8 & 9. Second, none of the detailed questions currently asked in the CEIS are asked. This provides great savings in that these attribute questions are asked for every itemized expense in the current procedure. Third, itemization of expenditures is not required, and so even simple descriptions of the expenses and their individual costs do not need to be recorded.

The development of the global question methodology and associated materials has reached a stage where quantitative field test comparison with the current methodology can be conducted. Statistical data derived from the expenditure reports might be examined, such as the total amount of reported expenditures. Alternatively, some form of validity data might be

obtained. In addition, the difference in time to complete the interview could be assessed. However, an investigation of the time savings attributable to the global questions needs to take into consideration the expansion of the global questions beyond the items currently collected in Sections 6, 8, 9 and 12. Moreover, if the global questions do pose less of a burden for respondents, data quality in other parts of the interview may be enhanced and this should be assessed as well.

One difficulty in conducting a quantitative field test is that changes in the methodology have been confounded with enhancements to the expenditure domain and Information Booklet cues. Such a test this would not provide specific assessments of the difference due to the global questions themselves or the developmental work to expand and enhance the collection of expenditures. This holds for the timing data as well. Reviewing the more extensive Information Booklet may lengthen the interview. In addition, a more extensive set of cues may lead to higher reporting and a lengthening of the interview. Clearly any timing test would need to consider the total expenditure estimates reported by respondents.

One may question whether a quantitative field study is necessary. Mock interviews demonstrated that the procedures can be managed well by FRs. There is little reason to believe that data from the global questions will be any less valid than data from the current CEIS questions based on observations from the numerous laboratory-based interviews that have been conducted. While quantitative data is not available from these interviews, there were no obvious limitations in respondent performance that would not also be expected in the context of the methodology currently employed in the CEIS. In the interviews conducted for the present research, participants answering global questions provided complete and accurate reports of their total expenditures.

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#### 9. APPENDIX

Below is a listing of the global question categories for Sections 6, 8, 9 and 12.

# Apparel, Household Equipment, Furniture, & Recreational Items

(NOTE: These categories are currently under development)

Clothing or Footwear

Jewelry or Other Personal Accessories

Cleaning, Alteration or Repair of Clothing and Accessories

Luggage, Cases, or Storage

Tools or Hardware Supplies

Lawn and Garden Equipment and Supplies

Outdoor Furniture, Equipment or Decorative Items

Cooking, Serving or Dining Wares

Kitchen Appliances

Housekeeping Appliances and Equipment

Heating, Cooling or Humidity Control Equipment

Safety or Security Equipment

Infant Furniture and Equipment

Furniture

Home Furnishings

Bed and Bath Linens and Accessories

Personal Care Appliances

TV, Video, or Photography Equipment and Supplies

Audio Equipment and Supplies

Computer Equipment and Supplies for non-business use

Telephone or Office Equipment and Supplies for non-business use

Sports and Exercise Equipment

Camping, Hunting or Fishing Equipment

Pets or Pet Equipment and Supplies

Games, Toys or Play Equipment

Equipment and Supplies for Sewing, Arts, Crafts or Hobbies

# **Vehicle Operating Expenses**

(NOTE: These categories are currently under development)

Mandatory Fees for Vehicles

Vehicle Parking and Tolls

Vehicle Fuels

Vehicle Cleaning

Vehicle Maintenance, Repairs and Parts

Vehicle Tools, Safety or Security Equipment

Vehicle Accessories and Customizing

Driver and Passenger Accessories

Vehicle Furnishings