LITERACY AND THE SELF-ADMINISTERED FORM IN SPECIAL POPULATIONS: A PRIMER

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INTRODUCTION

The use of a self-administered questionnaire presupposes the ability of respondents to read and comprehend the survey instrument. The choice of a self-administered mode may be constrained by factors not directly related to data quality. For example, cost may dictate the necessity of a mail survey. In addition, identifying respondents who have poor literacy skills within a large sample may be impossible, since reading difficulties can occur in all segments of the population.

The current paper discusses some features of literacy with respect to the reading of survey questions. It uses as a source of examples cognitive interviews which have been carried out by the authors on two decennial census questionnaires that are part of research for the year 2000 Census. These include the 1994 Coverage Test, and the Service-Based Enumeration (SBE) component of the 1995 Census Test.

The 1994 Coverage Test was part of a plan of research to improve within household coverage for the year 2000 Census. Areas where response rates had previously been low were oversampled in this mail survey. The forms were pretested in cognitive interviews recruited at the Alexandria, Virginia Human Services Office. The Service-Based Enumeration involved the preparation of a form to enumerate clients at shelters and soup kitchens. The choice of a self-administered mode in this case was primarily determined by cost. In addition, it was held to be easier to maintain confidentiality (required by Title 13 for decennial questionnaires) under the less than private conditions at these facilities. The special forms prepared for this enumeration were pretested in shelters and soup kitchens in Washington D.C. and New York City. Cognitive respondents at each of these sites demonstrated difficulties in dealing with the questionnaires. Many of these problems appeared to be the result of difficulties in reading.

The aim of this paper is to discuss certain processes which may occur when less-literate respondents are confronted with self-administered questionnaires. We will discuss:
1. The processing demands made on the reader by the written material;
2. The "distractors" the questionnaire presents (which may seem to less literate respondents like the "right answer");
3. The difficulties that these respondents may have in dealing with ambiguity;
4. The substitution of lexical items in the questionnaire by other words or phrases; and
5. The respondents' general familiarity with the conventions of filling out surveys and forms.

We hope to illustrate these processes using examples derived from the cognitive research described above, and to suggest further avenues of research. It is necessary to begin with a discussion of what is meant when we describe a respondent as having low literacy skills.

THE CONCEPT OF LITERACY

Current assessments of literacy examine ability of readers to function in "real world" literacy tasks, like applying for jobs or reading bus schedules. This position assumes that the simple ability to decode written items is not sufficient to establish literacy. Comprehension and a reader's ability to successfully deal with the written word are more important. Literacy is therefore defined in terms of the reader's ability to use written language to accomplish certain socially desired activities, for example: "using printed and written information to function in society, to achieve one's goals and to develop one's knowledge and potential." (Venezky, et al, 1987 p.3.) Observers sometimes assume that more literacy skills are now required for successful negotiation of social life, and that therefore the level of literacy necessary in the general population has risen. The concept of "functional literacy" was introduced to express the connection between social performance and literacy. (For example, Kirsch and Guthrie, 1978.)

It has also been suggested that literacy problems may be concentrated among certain populations. Homeless persons are thought to have high rates of literacy problems. In a survey that included more than 2000 homeless adults at California service locations, nearly one fourth of the respondents were found to have "low literacy skills". (California State Department of Education, 1992).

READING IN COGNITIVE INTERVIEWS

Cognitive interviews for self-administered questionnaires differ from those for interviewer-administered questionnaires primarily in that the respondent is asked to read anything he/she attends to in the printed matter of the questionnaire. This is necessary in order to allow the interviewer to keep

track of precisely what the respondent is looking at or thinking about. In order to simulate natural patterns of filling out the questionnaire, respondents may be instructed not to read anything that they don't think they would have read if they were filling out the questionnaire on their own. Many respondents find reading aloud somewhat unnatural or difficult, but are nonetheless encouraged to do so. The act of writing responses interrupts the respondents' flow of talk, and therefore most respondents must be reminded several times to continue to read aloud as the interview continues.

The transcript of what the respondent has read can be easily compared with the actual wording of the questions. This essential step allows the analyst to assess:

1. What parts of the questions or instructions the respondent is reading and leaving out. Thus, if a respondent stops reading after a question stem and moves directly on to the answer categories, it is reasonable to assume that the instructions following the question stem have not been read or processed.

2. Spontaneous alterations in question wording made by the respondent. These alterations may change the substantive meaning of the question and determine the choice of a response.

The transcript of the respondent's reading cannot be assumed to correspond exactly to the respondent's understanding of the questions and instructions. "Out loud" reading is conducive to slips of the tongue, most of which are recognized by the respondents. They may comment "well, you know what I mean," or some other marker to indicate that there is a gap between their spoken words and their understanding. In addition, respondents also fall silent in reading certain parts of the questionnaire. They may give other behavioral evidence of having seen the words.

READING SURVEYS

A central question which must be examined concerns how difficult our surveys are to read. Reading inventories like the National Assessment of Educational Progress (NAEP) (Kirsh and Jungblut, 1986) often include an element of "document literacy" because documents like forms and applications are a necessary part of successful daily living. The forms used in these inventories do not include anything directly resembling a survey. However, it is reasonable to assume that our decennial surveys pose at least a moderate level of difficulty. According to the authors of the NAEP, readers have difficulty when faced with reading tasks that require "difficult information processing such as locating the correct information in complex displays of print, holding information in "working memory" while finding additional information, transforming these fragments of information into new knowledge, and then writing or otherwise communicating the results of these complex cognitive activities." (Kirsch and Jungeblut, 1986).
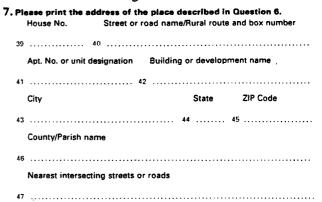
Our surveys call for many of these more complex literacy skills, and we can therefore expect some readers to find them difficult. In the following sections, we discuss and illustrate several features of the way readers process written information which may interfere with their responses to a survey.

1. Processing demands

Our surveys often include questions which require that respondents process information in ways which are not familiar to them. While these questions may pose little difficulty for more facile readers, they may lead to difficulty for others.

Skip instructions are frequently difficult for respondents to process, and the problem was accentuated among the respondents for the SBE questionnaire (SBEQ). A series of address blocks were provided (see Figure 1 for an example), where respondents were asked to provide addresses of places where they stay most of the time, where they stayed last night, and where they stayed on the first night of the service enumeration. These questions were designed to establish a usual residence and to permit unduplication of responses in this highly mobile population. Instructions were provided in two different places for each follow-up address that it was unnecessary to write the same address repeatedly if the person's answer was the same for each block. However, some respondents failed to do so, and repeated the same entry three times, even in instances where they commented on how annoying and unnecessary this was.

Figure 1

7. Please print the address of the place described in Question 6.

House No.   Street or road name/Rural route and box number

39 ....   40 ....

Apt. No. or unit designation   Building or development name .

41 .... 42 ....

City   State   ZIP Code

43 .... 44 .... 45 ....

County/Parish name

46 ....

Nearest intersecting streets or roads

47 ....

Respondents missing skip instructions is normally thought to be the result of formatting which makes the instructions difficult to find. No reader can follow a skip pattern he or she did not see. However, there

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is evidence in the SBE cognitive interviews that skip instructions may be difficult to process even when they have been read. The following passage from an interview summary illustrates this:

Q.9 Please print the address of the place where you stayed LAST NIGHT if different than the address in Question 7.

"The respondent looks at it for a minute and remarks, 'this is the same question. I asked her, the same question as which one, and she said 'number seven.' She reads it out loud to me, perfectly accurately, including the 'if different than in Question 7.' Then looks up at me and asks, so what do I do, write down the same place? She finally decides to do just that."

Despite noting the similarity between the two questions and reading the skip instruction, the respondent is unclear about what the question is asking her to do. It may be that the respondent is unable to process the contradictory demands of a question that both asks her to do something and allows her not to do it.

2. Distractors

A "distractor" is a printed element on the questionnaire which, although irrelevant, seems like it might be an answer to a question posed to the respondent. These "distractors" have the same form as the answer which is requested. For example, in the NAEP, an exercise involving a request audiovisual equipment was made harder for poor readers when the hours that the A.V. lab was open were shown at the top of the request slip. When asked what time the projector was needed, (information that was clearly marked on its own line,) poor readers sometimes offered the hours of operation as an answer. (Kirsch and Jungblut, 1986, p. 18-19).

This phenomenon also occurred among respondents for the SBEQ. Perhaps the clearest illustration occurred in one respondent's answer to an early version of the age question:

Q.2 What are this person's date of birth and age as of July 16, 1994?

This question, although technically grammatical, proved impossible for almost everyone to read fluently. They stumbled over the unexpected juxtaposition of "date of birth" and a plural verb, and sometimes tried out interpretations which applied the reference date to "date of birth". (For example, one respondent's first interpretation was that the question was asking only for birth dates in the latter part of the month, from the 16th to the 30th.) But despite these difficulties, most respondents managed to correct themselves and provide the information required. However, these ambiguities proved too much for one respondent, who filled in the boxes for "date of birth" with 7/16/95. He then wrote

in his age as "47", and when asked "What is your birthday" he was able to provide it. The information in the reference date was in the same form as the answer required, and perhaps as a result of other difficulties in the question, the attraction of the "distractor" determined this response.

The answer blocks in the SBEQ also provided a distractor. Two spaces were left for "House No." and "Apartment No or unit designation." In a few instances, the space for "House No." was used for an apartment or room number. Spatially, "Apartment No." appears directly below "House No." When respondents tried to provide a room number, they were distracted by the empty "House No" box, and erroneously supplied their answers there. (This was facilitated by some respondents' natural processing of address information. They were used to writing the number and the street together, and did so, even though the address block provided two separate boxes.)

3. Ambiguity

A common sense rule of question writing is that researchers should avoid ambiguity wherever possible. Some of the questions in the SBEQ proved to be ambiguous because of conditions specific to living in shelters and eating at soup kitchens, or because of poor question wording. It is possible to reword questions and answer categories, or to change question strategies, to correct the kinds of problems described above. In fact, many changes to were made to the SBE questionnaire to correct such conceptual ambiguities.

However, the suggestion that questions avoid all ambiguous words would be impossible to follow. In fact, it is in the nature of all language to contain ambiguity, since almost all words have multiple meanings in various contexts. The following discussion focuses on how the ambiguity created by these multiple meanings of words may affect responses to questionnaires.

Skilled readers appear to deal with this ambiguity by suppressing the irrelevant meanings of a word. Gernsbacher (1993), found that poor readers were less able to "suppress inappropriate meanings" activated by terms with ambiguous meanings. The experiment involved showing college students statements containing an ambiguous lexical item, like "He dug with the spade." They were then shown a test word and asked to judge if it fit with the sentence's meaning. At short time intervals, both poor and good readers had difficulty rejecting the test word "ace" as fitting with the garden meaning of "spade." However, when the time period was increased to 1 second, the better readers were able

to reject the test term while the poor readers were not. Gernsbacher (1993) concluded that "less skilled readers are less able to suppress inappropriate meanings." He also found similar less efficient suppression mechanisms operating for poor readers in non-verbal material.

The following response in an SBEQ answer block illustrates this process. The respondent in this case provided the complete street address in the space provided for "street or road", and then looked back at the "House No." box. He filled in "157", which was his estimate of the "number" of persons in his shelter. When he arrived at "Apartment No. or unit designation, he filled in "6" because there were six units at the shelter. These responses seem to involve the lexical ambiguity of the term "number." A correct response here to "apartment number" would involve accepting an interpretation of "number" as "numerical designation" and suppressing the interpretation "quantity".

4. Substitution of Lexical Items

Our cognitive respondents frequently substitute one lexical item (i.e. "word" or phrase) for another, and make other additions and deletions from the text. The effects of this lexical substitution on question interpretation are varied. In many instances, respondents are able to discover and correct the lexical substitution for themselves. For example, one respondent in the 1994 Coverage test read "mental status" for "marital status" and after a good laugh explained that he was married.

Other substitutions were not corrected but had remarkably little effect. For example the Hispanic origin question was misread: as "Spansive or Hispantic origin", "Spanish or Hispanic organ" (in the 1994 Coverage Test) and in several ways in the SBEQ research, for example, "Spanish or Histonic orge", and "Spanish or Hispanic original". In all of these cases the respondent was able to answer "no" to their reworded question. (There were difficulties in question interpretation which did not seem directly related to reading: several respondents believed that they were being asked a question about race, and looked in vain for their race among the answer categories.) Other SBEQ respondents substituted such varied items as "sensitive" for "Census", "intervening" for "interviewing" and "compete" for "complete". It should be noted that most of the respondents who misread the Hispanic origin question read "Spanish" and answer categories like "Cuban" correctly, and this may have been enough to allow them to respond. These contextual cues seem to allow respondents to answer appropriately in some instances, even if the misreading is extensive.

In other instance, lexical alterations can create distortions in question meaning. One item that was frequently misread occurred in the answer block of the

SBEQ. The line reading "County/parish" was often misread or confusing to respondents. The most common misreading was "Country/parish", and this lead respondents to write "United States of America" or "America". Another respondent read this address item consistently as "Country/Praise the name." He could not interpret this, and therefore left it blank.

One class of lexical substitutions is rather common. These are alterations in the grammatical markers in sentences. These are sometimes called "functors", or "grammatical morphemes". They do not take their meaning from representations of the world, but rather from the interrelationship between other semantic items. Although they are very frequent in any language, these grammatical markers are not thought to command a great deal of the reader's attention:

> "Because the grammatical morphemes are language-oriented, any given sentence in any language will normally contain quite a large percentage of them...When a person reads he often does not even notice many of the written grammatical morphemes. He is able to produce them automatically, for the sense demands that certain morphemes be used. Readers often do not pay any attention to the written grammatical morphemes since they can understand without looking at them. (Baucom, 1970 p. 63-64)

That is to say, the reader does not need to attend closely to a functor because normally the context will permit it to be supplied correctly. That is, the interpretation of the phrase "the two boys" will not suffer if the "s" is not perceived, because pluralness is implicit in the word "two."

However, many of the sentences included in our questionnaires may not contain such obvious contextual cues to meaning, at least for the respondents we are describing here. Therefore, when they do not attend closely and resupply a functor, it may not be the one which was originally written. Alterations in functors can cause large changes in the meaning of our questions because they carry the logical interconnections of the whole semantic string.

Certain difficulties in question interpretation that were the result of misread functors occurred in the SBEQ. One problem occurred in an instruction designed to allow the respondent out of writing the address of the same place in more than one place. In the original version of the questionnaire, this skip instruction read "Same place as provided in Question 7 - Turn the page and go to Question 10" However, several respondents read this as "some place as provided in question 7", which failed to make any sense at all. This was revised in the second version to

read "The same place as provided in Question 7", since it would be less likely to read "the some place".

Another question in the SBEQ was vulnerable to changes in functors. The question was designed to establish whether respondents in shelters and soup kitchens had a place they considered to be a usual residence. One version of this question read:

Q.6. Which of the following best describes the place where you stay overnight MOST OF THE TIME?

The definition of usual residence was expanded to include other places than housing units: if a respondent wanted to claim a location in a shelter or on the street as a usual residence, he/she was allowed to do so. However the writers of the question still intended the location selected to be a unique location, and for the respondent to select only one from the list of answer choices. If the question is read with "place" made plural, this is lost. For example, one respondent read the question as "Which of the following best describes the places where you stay overnight most of the time", and then checked both "Emergency shelter" and "On the street." He indicated that he stayed at the shelter when it rained. Since the respondent had transformed the question into the plural, the phrase "most of the time" no longer worked to define a unique place, but rather elicited a description of a usual routine for staying at different places.

5. Survey Conventions

As we have seen, respondents rely on contextual cues to disambiguate questions, to supply for themselves unread elements of the questionnaire, and to correct lexical mistakes in reading. We would like to suggest that the respondent's understanding of the questionnaire context affects questionnaire performance in another important way. The respondent's familiarity with questionnaires and the survey context in general is an important factor in being able to correctly negotiate a self-administered questionnaire. We will begin with a discussion of what respondents are expected to know about questionnaire format.

The issue of question numbering is a good example of how this expectations about questionnaire format functions. Respondents are expected to know the rule that "questions begin with question numbers." If respondents know the rules, but questionnaire designers break them, this can cause difficulty. For example, in the SBEQ, "Name" was not included as a numbered question. In the first questionnaire version, it was placed as a banner across the top of two columns of numbered questions. Seven of 16 respondents did not find the name box initially (although a few supplied it later.) It was apparent that the respondents simply began reading the questionnaire at the question numbered with a 1. (We were not administratively permitted to give "Name" a number. We instead moved "Name" into one column, closer to the start of the questions, and used a small graphic to call attention to it. This reduced but did not eliminate respondents skipping over "Name.")

A corollary to the question numbering rule is something like "it's not a new question until you see a new number." Some respondents in the SBEQ research apparently did not share this implicit expectation of the survey's authors. This was apparent in questions which had long answer categories or which left spaces for a number of write-ins. In those instances, respondents provided more than one answer because they apparently perceived that they were being asked more than one question.

The answer blocks in the SBEQ also elicited multiple responses without a change in question number. This answer block asked for information which is not usually included in a mailing address, in particular lines that asked for "county/parish name" and "name of shelter or nearest intersecting street". Several respondents treated these lines as a completely new request for information, unrelated to the mailing address they had provided above. For example, after providing an address on the top two lines, one respondent encountered "county/parish name." She remarked "OK, the parish name, we ain't got no parish, oh yes I do, my church is at..." and then provided a separate street address for her church. (She did not indicate that it was a church.) At the last line, she said that the nearest shelter ("for me anyway") was a specific facility that she liked and had used in the past. She provided a name and another street address. The answer block now contains three separate addresses, as though each line was asking for unrelated information.

It also seems possible that respondents have a set of expectations about the content of questionnaires. These content expectations provide important contextual cues which allow respondents to disambiguate difficult questions and to identify and self-correct errors in reading or interpretation. That is to say, when a respondent is able to notice that "mental status" is an unexpected term, and to check his reading of it, this is at least in part based on an understanding of the kinds of things that are likely to be asked on a Census questionnaire.

The respondents in the SBEQ research sometimes seemed not to have a clear idea about what a Census questionnaire was likely to ask. For example, a common lexical substitution was "nearest interesting street" for "nearest intersecting street." Several respondents treated this very literally. For

example, one respondent thought for a moment and decided to put down the "New York Hilcopter port" because he enjoyed watching the activity and it was a good place to think. Another respondent wrote in "34th street" because there was a mall there where she liked to shop. It is interesting to note that no respondent who interpreted the question in this way ever commented on how odd it was to be asking for an interesting street in the context of a Census questionnaire.

Respondents who lack a clear idea of what a Census questionnaire is likely to be about sometimes replace that with other understandings of context based on more salient or frequent experiences. On several occasions, respondents in the SBEQ research let us understand that they interpreted the presence of the cognitive interviewers in the shelters and soup kitchens as being similar to previous experiences with social workers. This was clear in the question asking about previous Census interviews. Respondents confused Census interviews with what appeared to be discussions with religious workers, with employment programs, and with "programs like that" in general. This led to a number of false 'yes' answers to the question.

The belief that we were social workers led to other question misinterpretations. For example, one respondent living in a shelter responded to a version of the usual residence question by saying "Well, it looks like it's asking me, it seems like you're trying to give me a little push...like me, I been here 14 months, and 14 months is enough for me, I wants out BAD." So he decided to mark off "An apartment or house you own or rent" because he didn't want to live in a room. The subsequent address block was interpreted in light of this reformulation in terms of his wishes for how he wanted to live. At "House no." he put down "3" because he hoped that there might be that many people in his house. Although he considered making up an address, he provided a street address of a place he lived before getting divorced, and supplied the name of the rental company. The entire answer is a fantasy based on what the respondent thinks is an acceptable answer for social workers trying to motivate him to leave the shelter.

Such contextual misinterpretations are not narrowly related to specific misreadings of questionnaire wordings. However, they influence the ability of respondents to respond accurately. They appear to stem from lack of experience with the knowledge implicitly required by questionnaires, and may therefore be considered to be part of "forms literacy."

Conclusions

In this paper we have attempted to outline and illustrate some of the processes which occur when persons with problems in literacy are faced with self-administered questionnaires. Since it is inevitable that certain persons with reading problems will be included in our samples, we believe that further systematic research is necessary. The aims of this research should be twofold. We need to place the reading behavior of those with fewer literacy skills in context of a wider understanding of questionnaire reading in general. This will allow us to understand whether, and under what conditions, more literate persons will show the same kinds of behavior we have described here. A second aim would be to discover ways to write questions that are less troublesome to inadequate readers. Several suggestions arise from the previous discussion. For example, since readers rely on context to disambiguate meanings, it may be prudent to include some redundancy in question wordings. (Short may not always be better.) In addition, it may be wise not to allow major elements of question meaning to rest on grammatical markers, since reading errors are likely to occur in them.

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