

# HOW DO YOU MEASURE "AWARENESS"? EXPERIENCES WITH THE LEAD-BASED PAINT SURVEY

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- The effects of lead on unborn children
- Lead paint produces a harmful dust

## I. Background

Lead is a powerful toxicant with no known beneficial purpose in the human body. During the past ten to fifteen years, average blood lead levels have decreased due to the reduction of lead in gasoline, canned food, and drinking water. However, as these other sources of lead exposure have declined, the issue of lead problems originating from paint has grown in relative importance.

Efforts to deal with problems caused by lead paint are still in their infancy. The Congress recently passed legislation containing major changes pertaining to the control of lead-based paint hazards and the reduction of lead exposure. The legislation also required that the Department of Housing and Urban Development (HUD) evaluate the impact of the legislation.

Towards this goal, HUD contracted with the Census Bureau to design and conduct a household survey which would focus, among other things, on lead paint knowledge and awareness. This survey would be a supplement to the Current Population Survey (CPS) in December 1994.

This paper will focus on the process used to design a series of questions that could produce baseline measures of awareness and knowledge about lead-based paint hazards. It first describes the pretesting methods and then shows examples of different formats of a question and discusses the results of each format.

## II. Challenges in Designing the Questions

Experts on lead paint from the HUD determined the substantive content of the questions. They were interested in measuring the public's awareness and knowledge for the following issues:

- Lead causes health problems for children
- The hazards of eating paint chips
- Lead paint is found in older homes
- The effects of lead on a child's ability to learn

Initial versions of the questionnaire distinguished the first two of these as measuring general awareness of lead issues while the others measured fairly specific points of knowledge. This paper will refer to them as awareness and knowledge questions respectively, but it should be noted that this distinction became less important as development progressed.

Measuring awareness or knowledge of issues creates several interesting challenges. First, it is important to measure what respondents know as well as what they do not know. This requires optimizing responses based on an individual's knowledge rather than by guessing. Thus, it is essential to enhance the likelihood of having a respondent answer "don't know" when the issue is unfamiliar rather than having them make a guess.

Research in the literature suggests that this can be a dilemma since it is socially desirable to appear well-informed and seeming well-informed is not easily accomplished with a "don't know" response. For example, Bishop (1980) has shown that respondents will even venture opinions about non-existent, fictitious issues rather than admitting that they "don't know" about the issue. This implies that unless questions regarding knowledge are structured so that respondents feel comfortable reporting a "don't know" there is a likelihood that a portion of respondents will affirm knowledge that they do not have.

Sudman and Bradburn (1989) suggest that framing a knowledge question in terms of an opinion question reduces the threat to the respondent. Respondents are therefore not asked directly if they possess specific knowledge but are asked in a softer format what their opinion on the topic is. By adopting this opinion statement framework we hoped to increase the use of "don't know" responses in cases where the respondent did not possess knowledge of the issue.

Schuman and Presser (1981) and Bishop et al. (1983) have shown that using full filters (in which the question first asks if the respondent has an opinion on the topic, and then, as a separate question, what that opinion is) significantly increases the number of "don't know"

responses. Although this was in line with the goals of this project, the use of a filter question did not seem appropriate since these questions were not actually opinion questions. This research, instead, used a quasi-filter; that is, we simply added "don't know" to the response options.

Another issue to take into consideration was the introduction to the question. Schuman and Presser (1981) show that a full filter that precedes an item and emphasizes the frequency of no opinion is more effective in encouraging "don't know" responses than is a quasi-filter. In the context of this research, we were using the quasi-filter, so we decided to incorporate the "encouragement" into the introduction.

Making respondents feel comfortable answering "don't know" to a question is difficult in itself but it should be noted that it may become even more difficult in the context of the CPS interview. The interviewers who conduct the CPS have been trained to probe "don't know" responses. It is therefore possible that earlier in the interview or in previous CPS interviews<sup>2</sup>, probing of "don't know" responses by the interviewer gave the respondent the impression that "don't know" was an undesirable answer.

### III. Methodology

Several pretesting methods were used to develop and refine the questions. Pretesting began with a series of cognitive think aloud interviews which allowed the researchers to probe respondents to find out how they came up with their answers. These cognitive interviews were conducted at both the Census Bureau and the National Center for Health Statistics (NCHS). The Census Bureau researcher conducted 15 interviews - 9 in the Washington D.C. area and 6 in Jackson, MS. The NCHS researchers conducted 14 interviews in the Washington D.C. area.

After analyzing the results of the cognitive interviews and revising the questionnaire, the Census researcher conducted an additional round of cognitive interviews. This consisted of 6 interviews using informal probing of respondents to test the revised questions.

The next step in this process was a field test of 500 households from nine cities in the south and midwest. The interviewers were debriefed after interviewing was completed.

Interviews from the field test were tape recorded and behavior coded. A total of 381 interviews were behavior coded and analyzed.

### IV. Results of cognitive pretesting

Two question formats were initially pretested in an attempt to elicit information that was based on knowledge and awareness rather than on guessing. For reasons discussed above, both of these formats framed the lead paint questions in terms of opinions and used a quasi-filter. In one format, the topic was posed in the form of a question; in the other, it was posed in statement form.

For example, the Question/Opinion format consisted of framing the topic in terms of an opinion question which required a yes, no, "haven't heard about this" or "don't know about this" response.

In an attempt to make the respondent willing to voice a "don't know," the introduction stated that not everyone has heard of some of the issues. An awareness question read:

*"I am going to read several statements about our environment. Not everyone has heard about some of these issues. If you haven't heard about the topic I read, feel free to tell me so.*

*Do you think that lead paint can cause health problems for young children, or haven't you heard about this?"*

A knowledge question read:

*"These next couple of statements deal specifically with lead in the environment. Again, not everyone knows about these subjects, so feel free to tell me if you don't know about the topic.*

*Do you think that lead in the body can affect a child's ability to learn, or don't you know about this?"*

This question has a variation of a don't know response because "haven't you heard about this" did not fit the knowledge questions.

The second format made each item into a statement and asked the respondent whether or not he/she agreed, disagreed or had no opinion about the issue. This format is termed "Statement/Opinion" because, again, the item

is asking for the respondent's opinion, but this time the topic is given as a statement.

Only a brief introduction preceded the questions which stated the response options. For example, an awareness question read:

*"For each of the following statements, please tell me if you agree, disagree, or have no opinion.*

*Lead paint can cause health problems for young children. Do you agree, disagree, or have no opinion about this statement?"*

A knowledge question read:

*"Lead in the body can affect a child's ability to learn. Do you agree, disagree or have no opinion about this statement?"*

In the "Question/Opinion" format, the introduction stressing the acceptability of answering "haven't heard" or "don't know" worked well. Also, the knowledge questions seemed to benefit from having a variation of the "don't know" response. However, asking respondents to say that they "haven't heard" about the awareness issue did not work well because respondents took this phrase literally. When respondents didn't know much about the issue, they noted that they had heard something about it and, thus felt they could answer the question. Saying "haven't heard" seemed to be admitting ignorance.

Framing the lead paint issues in terms of a statement as in the "Statement/Opinion" format seemed to work well. The statement highlighted the issue and allowed the respondent to concentrate on that issue in one sentence. The task of responding was then posed in the next sentence. On the negative side, the use of agree/disagree/no opinion responses for both the awareness and knowledge questions did not seem to fit the statements particularly well. Respondents did not equate "no opinion" with "don't know."

To maximize the advantages of each format, the questions were revised to first have an introduction and then present each issue in statement format. Researchers also decided to expand on the introduction to make it sound even more acceptable to say "don't know" by stressing the importance of eliciting the respondent's actual level of knowledge.

However, the decision about the format of the responses was less clear-cut. Neither question format elicited any "no opinion" or "haven't heard" responses for the

awareness questions during the first round of cognitive testing. This may represent either respondents' actual awareness of the issues or a reluctance to use the options. Note that neither of these options explicitly used "don't know."

For the knowledge questions, having an explicit "don't know" response in the "Question/Opinion" format seemed to work better than the "Statement/Opinion" responses which didn't have a "don't know" response. However, framing the responses as an opinion and adding "don't know" to the response options still weren't compatible. Therefore, the format was changed in the next round of cognitive testing from an opinion format to a factual format for the response categories. The respondents were asked whether the statements were true, not true, or if they didn't know. This format is entitled the "Statement/Fact" format since the topic was presented as a statement and the responses were framed as a fact. An example of the revised introduction and an awareness question was:

*"With these next few questions, we are trying to find out what people know about lead paint hazards. I am going to read a series of statements and for each one, I want you to tell me if it is true, not true, or if you don't know about the topic.*

*We plan to use the answers to design an information campaign. So, it is important for you to tell me if you don't know about the topic that I ask about. We prefer that you don't guess at your answers. Actually, we expect there will be some topics that you don't know about.*

*Lead paint can cause health problems for young children. Is this true, not true, or don't you know about this?"*

A knowledge question read:

*"Lead in the body can not affect a child's ability to learn. Is this true, not true, or don't you know about this?"*

Using this format, there were actually a couple of respondents who said "don't know" to the awareness questions. Again, this does not imply that the others did not guess, but it seemed to be going in the right direction. The number of don't know responses to the knowledge questions also increased.

Based on positive response to the "Statement/Fact" format, that is, a statement followed by "true/not true/don't know about this," this format was chosen for the field test.

V. Results of the Field Test

The field test incorporated the results of the cognitive interviewing in a test using current CPS interviewers. Data from the field test again showed that the don't know response was used for both awareness and knowledge questions.

During the debriefings, interviewers said that many of their respondents used the word "false" instead of "not true." Earlier, the word "false" had been considered, but was rejected because it sounded too "test-like." Since respondents didn't mind the word and actually seemed to prefer it, the final wording adopted the word "false." Interviewers also suggested using "not sure" instead of "don't know about this." Since the researchers felt it was important to explicitly use the word "don't know," they were hesitant to make this change. The compromised wording used the phrase "don't know for sure."

The field test interviews were taped and subjected to behavior coding to analyze the types of interactions between respondents and interviewers for each question. The behavior coding results showed that interviewers made slight changes to the wording of these knowledge and awareness items about one third of the time. It also showed that respondents interrupted the reading of these items between 10% and 25% of the time. This suggests that the question which asks if the statement was true, etc., was not always read or was interrupted. Some interviewers suggested dropping this question for most of the statements. Others admitted that although it was repetitive, they thought fewer respondents said "don't know" when they didn't read the options than when they persisted and read them. Although the questions could seem repetitive to the respondents, researchers decided to keep the question with the response options for each of the statements.

The final wording that was used for the survey was a revised "Statement/Fact" format (see Appendix A for the wording of all items). In the end, the awareness and knowledge questions used the same introduction and format.

The introduction read as follows:

*"With these next few questions, we are trying to find out what people know about lead issues. We plan to use these answers to design information campaigns. So, it is important for you to tell me if you DON'T know about the topic that I ask about. We prefer that you don't guess at the answers. Actually, we expect there are some topics that you don't know about.*

*Now I am going to read a series of statements. After each one, please tell me if it is true, false or if you don't know for sure.*

An awareness question read:

*Lead paint can cause health problems for young children. Is this true, false, or don't you know for sure?"*

A knowledge question read:

*"Lead in the body can affect a child's ability to learn. Is this true, false, or don't you know for sure?"*

VI. Results from the Survey

Data from the survey shown in Table 1 suggest that we were successful in eliciting "don't know" answers from respondents. The don't know rates ranged from about 9 percent for the health problem question to almost 45 percent for the question about unborn children.

TABLE 1. Don't Know Rates

<u>Item</u>	<u>Percent</u>	
	<u>Don't Know</u>	<u>N</u>
Health problems	9	4249
Found in older homes	18	8351
Ability to learn	25	11637
Unborn children	44	20628
Dust	44	20458
Eating paint chips	10	1545

The next step was to analyze the survey data to see if subgroups of the population reacted differently to the

questions. One would expect, for instance, that the less educated respondents would have higher don't know rates if they actually admitted when they didn't know the answer. On the other hand, the literature cautions us that persons with less education have more of a tendency to acquiesce. If this were the case, one would expect the less educated to have a lower don't know rate because they would guess more.

Table 2 presents the data from the survey for each question divided into two education groups - those with a high school diploma (or equivalent) or less and those with at least some college. Statistical tests for significance which takes into account the complex sample design of CPS have not yet been conducted. However, if these differences behave as expected, it would seem that the questions were successful in getting respondents to admit when they didn't know the answer to a question.

TABLE 2. Don't Know Rates by Education Level of Respondent

Item	Percent Don't Know	
	≤ High School Diploma/GED (N)	Some College (N)
Health problems	12 (2936)	6 (1272)
Found in older homes	24 (5605)	12 (2689)
Ability to learn	31 (7351)	18 (4222)
Unborn children	51 (11967)	37 (8573)
Dust	49 (11474)	39 (8887)
Eating paint chips	13 (2962)	6 (1460)

The data were also broken down by family income levels and race. These are presented in Tables 3 and 4. Again, a thorough statistical analysis has not been completed on these data, but preliminary results seem favorable to the design of the question. That is, there seems to be higher don't know rates among respondents with lower income and, perhaps not significantly, those who are not White. Analysis taking into account the correlation between these variables must also be conducted.

TABLE 3. Don't Know Rates by Family Income of Respondent's Household

Item	Percent Don't Know		
	<\$20K (N)	\$20K - \$39,999 (N)	≥\$40K (N)
Health problems	15 (2227)	8 (1031)	4 (613)
Found in older homes	28 (4177)	16 (2168)	9 (1354)
Ability to learn	33 (4904)	25 (3379)	17 (2527)
Unborn children	51 (7582)	44 (6056)	38 (5571)
Dust	49 (7267)	43 (5974)	40 (5857)
Eating paint chips	14 (2158)	8 (1130)	5 (795)

TABLE 4. Don't Know Rates by Race of Respondent

<u>Item</u>	<u>Percent Don't Know</u>		
	White (N)	Black (N)	Other (N)
Health problems	8 (3283)	11 (525)	21 (414)
Found in older homes	16 (6325)	28 (1295)	36 (693)
Ability to learn	25 (9786)	25 (1154)	34 (653)
Unborn children	44 (17539)	46 (2145)	45 (882)
Dust	43 (17206)	47 (2198)	51 (990)
Eating paint chips	9 (3481)	12 (558)	21 (398)

REFERENCES:

Bishop, George F., Robert W. Oldendick, Alfred J. Tuchfarber, and Stephen E. Bennett, (1980), "Pseudo-Opinions on Public Affairs." *Public Opinion Quarterly*. Vol 44, Number 2, 198-209.

VII. Conclusions

This research proved informative on several fronts. First, cognitive interviews proved to be a useful tool and gave us insights into this topic which are not always evident using standard interviewing techniques. We learned that softening these questions by treating the as opinion questions was not appropriate.

Third, it was appropriate to introduce the notion that "don't know" was acceptable, even expected. Using the words "don't know", however, still needed to be softened.

Finally, this research showed that the conclusions drawn from pretesting seem to be supported by actual survey data.

NOTE:

<sup>1</sup> This paper reports the general results of research undertaken by the staff of the Census Bureau and the U.S. Department of Housing and Urban Development. The views expressed are attributable to the authors and do not necessarily reflect those of the Census Bureau or the Department of Housing and Urban Development.

<sup>2</sup> Households in the CPS survey are interviewed for a total of 8 times. They are interviewed for four months in a row, have an 8 month hiatus and then are interviewed for another 4 months. In a given month, one-eighth of the sample is in each rotation.

Bishop, George F., Robert W. Oldendick, and Alfred J. Tuchfarber, (1983), "Effects of Filter Questions in Public Opinion Surveys." *Public Opinion Quarterly*. Vol 47, Number 4, 528-546.

Sudman, Seymour and Norman M. Bradburn, "Questions for Measuring Knowledge," Chapter 4 (pp 88-118) in Asking Questions. Jossey-Bass: San Francisco, 1982.

Schuman, Howard and Stanley Presser, "The Assessment of No Opinion," Chapter 4 (pp 113-146) in Questions and Answers in Attitude Surveys. Academic Press, INC.: San Diego, 1981.

#### APPENDIX A. Final Question Wording

- 1) Lead paint can cause health problems for young children. Is this true, false, or don't you know for sure?
  
- 2) Lead paint is more likely to be found in newer homes than in older homes. Is this true, false, or don't you know for sure?
  
- 3) Lead in the body can affect a child's ability to learn. Is this true, false, or don't you know for sure?
  
- 4) Unborn babies can not get lead poisoning. Is this true, false, or don't you know for sure?
  
- 5) Paint produces a fine dust as it decays. Is this true, false, or don't you know for sure?
  
- 6) Eating paint chips can be poisonous. Is this true, false, or don't you know for sure?