

Respondent Preferences Toward Audio-CASI and How That Affects Data Quality

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Introduction

As the social and economic problems of the United States become more complex -- AIDS, sexual abuse, violence, homelessness, corruption -- social scientists are called upon more frequently to identify and understand behaviors that are private and sensitive. Survey researchers have attempted to obtain this information by asking people to report their own behaviors in interviews, and have concluded, not surprisingly, that the more private the forum for reporting, the more accurate the report (Bradburn and Sudman, 1979; Bradburn, 1983). Moreover, in demonstrated experiments, the self-administered interview has been determined to provide the best environment for the reporting of many types of sensitive behaviors (Hay, 1990; London and Williams, 1990; Aquilino and LoSciuto, 1990; Schwarz, et al, 1991; Turner, et al, 1992).

Limitations of the self-administered interview, however, are obvious. The respondent must have adequate reading skills, and must be able to understand and follow the questionnaire format, a novel experience for many (Lessler and Holt, 1987). Consequently, the burden on the researcher is to design a questionnaire void of complexity yet accomplishing the research objectives. Solutions to this dilemma have been evolving. The successful use of a Walkman-type device in the Youth Risk Behavior Survey conducted by the National Center of Health Statistics (NCHS) (Camburn, et al, 1991) eliminated the need for adequate reading skills by the respondent. But this method could not use skip instructions to access questions, thereby restricting the complexity of the instrument.

Incorporating audio with a computerized self-administration of a questionnaire (audio computer-assisted self interviewing, or Audio-CASI) has offered an improved solution. With Audio-CASI the respondent listens to a voice-digitized recording of the questions and answer choices over earphones and keys the answers into a microcomputer. While providing privacy and eliminating the need for respondent literacy, this technology also allows the researcher to design complex questionnaires and provides standardized questionnaire administration.

Preliminary investigation of Audio-CASI has been underway for the past several years by Research

Triangle Institute (RTI) (O'Reilly, et al, 1992a, 1992b, 1994). Small-scale implementation of Audio-CASI demonstrated great promise in the National Survey of Family Growth (NSFG), Cycle V Pretest conducted by RTI (Mosher and Duffer, 1994) and in the Women's Health Study conducted by the National Opinion Research Center (NORC) (Tourangeau, et al, 1994). For the first time, however, Audio-CASI is currently implemented on a national survey of 10,500 respondents for the NSFG, Cycle V main data collection effort being conducted by RTI for NCHS. This paper presents preliminary findings from 10,000 of those respondents. Our discussion first examines the attitudes of the respondents toward Audio-CASI. Next, we look at how our 10,000 respondents used the Audio-CASI technology. Finally, we identify and describe a group of respondents who reported more sensitive behaviors in Audio-CASI than they reported to the interviewer.

Method

In January, 1995, RTI launched the Cycle V NSFG data collection effort to conduct 10,500 interviews from a nationally represented sample of women between the ages of 15 and 44. The NSFG is a periodic study about women's health and childbearing. The questionnaire focuses on the many factors that affect women's chances of becoming pregnant, and the likelihood that pregnancy will result in live births.

The CAPI interview includes questions on the age when women begin having intercourse; times when they are not having intercourse; marriage, divorce, and remarriage; contraceptive use, including sterilization; effectiveness of contraceptive methods; infertility; breastfeeding; and pregnancy outcomes, including miscarriages, stillbirths, and induced abortions. A \$20 incentive is paid to the respondents at the end of the interview. The decision to add an Audio-CASI component to the Cycle V questionnaire grew out of concern with the accuracy of reports of sensitive behaviors.

The Audio-CASI component is administered near the end of the CAPI questionnaire and prior to the collection of contact person information that will be used for follow-up interviews. The interviewer first explains the purpose for using the Audio-CASI

technology, and then instructs the respondent on the use of the computer keyboard, including the number keys, the [ENTER] key, and some specially designated function keys that enable the respondent to increase or decrease the sound in the earphones, turn the computer screen on or off, and so forth. As part of this instruction, the interviewer assists the respondent in completing several practice questions. The interviewer then moves across the room so the respondent can complete the remainder of the Audio-CASI questions in private.

The Audio-CASI portion of the questionnaire consists of three sections. The first section contains questions which are also asked by the interviewer earlier in the CAPI portion of the questionnaire. These include questions on abortion and the number of sexual partners (for the past 12 months, for the past 5 years, and lifetime). In the introduction to the first section, the respondent is told to include any abortions and sexual partners that she may have already reported to the interviewer and any that she did not want to report to the interviewer.

The second section of the Audio-CASI component consists of sensitive questions not previously asked by the interviewer. It includes questions on forced sex and such HIV-risk behaviors as drug injecting and needle sharing. There are also HIV-risk questions about the respondent's partners in the past 12 months, including whether these men have had sex with other men, injected drugs or shared needles with other users, and had sex with other women around the same time they had sex with the respondent. The second section also includes questions asked only of respondents under the age of 20 who have never lived on their own. They are about the respondent's parents, including their alcohol and drug use and incidences of physical violence between her parents and between the respondent and her parents.

In the last section, the respondent is asked five questions to evaluate Audio-CASI. The first question asks her whether she thinks the interviewer-administered CAPI method or the Audio-CASI method lets people give more honest answers. The second question asks the respondent to rate how easy or difficult it was to use Audio-CASI. The third question asks whether she used Audio-CASI by listening to the earphones and reading the screen, just listening to the earphones with the screen blank, or just reading the screen and turning the earphones off. In the fourth question, the respondent is asked whether she felt more comfortable answering the questions on abortion and sexual partners by telling the interviewer or using Audio-CASI. Finally, the respondent is asked to rate how likely it is that she would have given different answers to some of the other

questions asked by the interviewer if she could have typed the answers in herself using Audio-CASI.

For this paper, we first examined how respondents felt about the Audio-CASI methodology. We then examined the way in which respondents chose to use the Audio-CASI technology. Last, we identified those respondents who increased their report of sensitive behaviors in Audio-CASI, compared their demographic characteristics to the rest of the respondents, and examined factors that might influence them to increase their report of sensitive behaviors.

Findings

We begin the discussion of our findings with a demographic profile of the 10,000 respondents we analyzed. Table 1 presents a profile of the respondents by age, race, Hispanicity, education, marital status, employment status, and annual household income. We also profile the respondents on other variables that might influence their attitudes towards Audio-CASI, including the number of sexual intercourse partners they have had in their lifetime, the number of times they have been pregnant, and their age at first intercourse.

Attitudes Toward Audio-CASI

How did the sample of 10,000 women respond to Audio-CASI? We asked the respondents to tell us: *Which of the methods do you think lets people give more honest answers?* Eleven percent of the respondents answered "the interviewer asking the questions out loud and entering the answers into the computer"; 49% answered "listening to the questions on the earphones and entering the answers into the computer"; and for 39% it did not matter. When examining the findings for this question, by demographics and other characteristics, no strong characterization emerges. Another Audio-CASI question was: *How easy or difficult was it for you to type the answers into the computer?* Virtually everyone (98%) responded "very easy" or "easy"; 2% responded "difficult" or "very difficult". The next Audio-CASI question was asked of all women who reported having had sexual intercourse: *The questions on abortion and the number of sexual partners were asked earlier by the interviewer and just now over the earphones. Were you more comfortable answering these questions when the interviewer asked them or when you heard them over the earphones?* Ten percent of those responding were more comfortable answering the questions when the interviewer asked them, 38% were more comfortable answering the questions using Audio-CASI, and for 51% it did not matter. Again, the demographic distinctions by response to this question are slight.

Respondents were asked to tell us: *How likely is it that you would have given different answers to some of the questions the interviewer asked you if you could have typed the answers into the computer yourself?* Nearly one third (28%) of the respondents reported some likelihood -- "very likely" or "somewhat likely" -- and about two-thirds (71%) reported "not very likely" or "not at all likely" to give different answers using Audio-CASI. We found no difference by age, but 44% of Blacks compared to 25% of Whites indicated some likelihood of giving different answers using Audio-CASI. Forty-one percent of the Hispanics responded "very likely" or "somewhat likely" compared to 29% of the non-Hispanics. As the level of education increased, the percentage of women who reported some likelihood of giving different answers using Audio-CASI decreased. Forty percent who earned \$20,000 or less reported some likelihood versus 27% who earned more than \$20,000 per year.

The percentage of women who responded "very likely" or "somewhat likely" increased as the number of reported lifetime partners increased. And, as the number of reported pregnancies increased so did the percentage of women who reported some likelihood that they would give different answers using Audio-CASI. Of those who reported their age at first intercourse as under 16, 37% said they would be very or somewhat likely to give different answers using Audio-CASI, as compared to 29% who reported their age at first intercourse as 16 or older.

Use of Audio-CASI

We next asked respondents how they used Audio-CASI: *For all or most of this part of the interview, did you listen to the earphones and read the answers on the screen, listen to the earphones and turn the screen off, or read the screen and turn the earphones off?* More than half, 53%, listened to the earphones and read the answers on the screen; 2% just listened to the earphones, and 44% just read the screen. Forty-four percent of the Whites just read the screen compared to 28% of the Blacks. Sixty-four percent of Hispanics used Audio-CASI by listening and reading compared to 58% of non-Hispanics. The higher the level of education, the greater the percentage of women who used Audio-CASI by just reading the computer screen. Of those who had ever worked or were currently employed, 40% just read the computer screen, compared to one-fifth who had never worked. One-third who earned less than \$20,000 per year reported reading the screen only versus 43% who earned \$20,000 or more.

The Increased-Reporting Group

We base the following discussion on the assumption that higher reporting of sensitive behaviors is a more accurate indicator of those behaviors. We were able to assess whether Audio-CASI provided more accurate data by measuring whether the reports in Audio-CASI of some sensitive behaviors were higher than reported to the interviewer. We identified this Increased-Reporting Group, (IRG), defined as respondents who reported either more abortions or more sex partners in the past twelve months in Audio-CASI than to the interviewer, and we examined their characteristics. One-fifth of our sample (1,837) was in the IRG. For 75% of the respondents the number of reported abortions or sexual partners did not change in Audio-CASI, 4% reported a decrease in the number of abortions or sexual partners in Audio-CASI, and about 1% of the respondents had missing data that did not allow us to make a determination. Table 2 describes the IRG by demographics and other characteristics. It is noteworthy to point out that 31% of all Blacks compared to 14% of all Whites were in the IRG. Only 16% of the respondents in the IRG had some college education. The income level for 28% of the respondents in this group was less than \$20,000 compared to only 15% whose income was \$20,000 or more. Only 8% in this group reported one lifetime partner, and the percent of respondents increased as the number of partners increased. For all other respondents the percentage decreased as number of lifetime partners increased. An upward trend can also be seen in the number of pregnancies for the IRG. Finally, nearly one-third of the respondents in the IRG reported age of first intercourse at 16 or younger. Table 3 shows how the Increased-Reporting Group responded to our Audio-CASI questions. Sixty percent in the IRG compared to less than half of all other respondents thought Audio-CASI lets people give more honest answers. Over half in the IRG compared to one-third of all other respondents felt more comfortable answering sensitive questions using Audio-CASI. Over half in the IRG compared to less than one-fourth of all other respondents reported some likelihood that they would give different answers using Audio-CASI. Compared to all other respondents, fewer in the IRG used Audio-CASI by just reading the screen and more used the method by listening to the tape and reading the screen.

Discussion

Our findings show a broad-based acceptance of the Audio-CASI technology among females between the ages of 15 and 44. These respondents report the

technology easy to use and demonstrate no evidence of computer phobia. They are also aware of the attributes of Audio-CASI. Respondents thought Audio-CASI lets people give more honest answers and were more comfortable using Audio-CASI to answer sensitive questions. Furthermore, respondents seem to understand that Audio-CASI provides a more private environment in which to report sensitive behaviors.

The acceptance of Audio-CASI among this population is an important finding, and gives researchers the confidence to use the technology with any socio-economic group. But of greater importance is the finding that the technology works the way it is intended. That is, people do report more incidences of sensitive behaviors using Audio-CASI than to the interviewer. Who are the women who increase their report of sensitive behaviors with Audio-CASI? Research has shown that Blacks and low-income women experience more behaviors that may be sensitive to report, such as more abortions and more sexual partners, than other women (Henshaw, 1988; Leigh, et al, 1993). Our data support this finding, and, furthermore, show that these women comprise a significant portion of our Increased-Reporting Group. More than twice as many Black respondents (31%) than White respondents (14%) increased their report of sensitive behaviors in Audio-CASI. Nearly twice as many respondents with an income of less than \$20,000 (28%) than respondents with an income of \$20,000 or more (15%) increased their report of sensitive behavior in Audio-CASI. The educational level of the IRG is less than all other respondents. The findings also show that more women in the IRG report greater numbers of lifetime partners, pregnancies, and incidences of forced sex, and more women report first intercourse at under 16 years of age. These findings suggest that women who exhibit sensitive behaviors are more likely to report more of these behaviors using Audio-CASI than to an interviewer. Why do these respondents increase their report of sensitive behaviors with Audio-CASI? We believe that the private setting offered by Audio-CASI creates an environment in which these women are more likely to report the behaviors.

Finally we address the issue of how respondents used Audio-CASI. First, we put forth the premise that the optimal way to use Audio-CASI is by listening to the earphones and reading the computer screen. This ensures that respondents, who may be even marginally literate, know what the questions are, that the questions are standardly administered, and that the private environment in which to answer sensitive questions is maintained. Well over half of our respondents used Audio-CASI in this optimal way. How does this group compare to its counterpart who used Audio-CASI by

just reading the computer screen? A greater number are Black and Hispanic, have less education, a lower income, and more have never worked. This group has had more lifetime sexual partners and more pregnancies. More reported their first sexual intercourse at age 16 or under. It is interesting to note that, demographically, this group is similar to the Increased-Reporting Group. Perhaps this group, who has more sensitive behaviors to report, feels it is necessary for them to hear and read the questions in order to do a better job of reporting. It is clear, from these findings, that respondents do use Audio-CASI by listening and reading and that researchers must provide this option. Furthermore, it is precisely those respondents to whom the technology is directed who use Audio-CASI in this way.

In conclusion, our findings regarding Audio-CASI, although limited to a specific population, demonstrate that this technology will potentially serve an important role in the collection of survey data. Further investigations of the Cycle V NSFG Audio-CASI data collection effort may provide additional information about how this technology contributes to data quality. Other, current surveys employing Audio-CASI and specific research to study its potential will also contribute to our knowledge. The Prospective Longitudinal Study of Adolescent Health that is being conducted by NORC will tell us how Audio-CASI works with youths between the ages of 12 and 18. At RTI, we are currently investigating the benefits of Audio-CASI to report sensitive behaviors under a grant from the National Institute of Child and Human Development. These efforts, as well as others of which we may be unaware, will add to our experiences and knowledge about Audio-CASI and contribute to the continuous goal of collecting quality survey data.

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TABLE 1. DEMOGRAPHIC CHARACTERISTICS OF 10,000 RESPONDENTS

Characteristics	N	Percent
AGE		
14-20 years	1,621	16%
21 years or older	8,363	83%
RACE		
White	7,101	71%
Black	2,294	23%
Other	565	6%
HISPANICITY		
Hispanic	1,407	14%
Non-Hispanic	8,570	86%
EDUCATION		
11th grade or lower	1,698	17%
12th grade or GED	3,518	35%
Some college	4,768	48%
MARITAL STATUS		
Never married	3,708	37%
Ever/currently married	6,285	63%
EMPLOYMENT STATUS		
Never worked	673	7%
Ever/currently work	9,312	93%
HOUSEHOLD INCOME¹		
Under \$20,000	2,510	25%
\$20,000 or more	6,354	64%
NUMBER OF LIFETIME PARTNERS		
None	952	10%
One	2,399	24%
2 to 3	2,299	23%
4 or more	4,204	43%
NUMBER OF PREGNANCIES		
None	2,896	29%
1 to 3	5,275	53%
4 or more	1,815	18%
AGE AT FIRST INTERCOURSE		
Under 16 years	2,396	27%
16 years or older	6,614	74%

¹11% missing (don't know, refused)

TABLE 2. PERCENT OF RESPONDENTS WHO INCREASED REPORTING FOR VARIOUS DEMOGRAPHIC SUBGROUPS

Characteristics	Sample Size of Subgroup	Percent of Rs Who Increased Report in Audio-CASI (N=1,837)
AGE		
14-20 years	1,623	20%
21 years or older	8,363	18%
RACE		
White	7,109	14%
Black	2,298	31%
Other	566	17%
HISPANICITY		
Hispanic	1,410	19%
Non-Hispanic	8,581	18%
EDUCATION		
11th grade or lower	1,700	23%
12th grade or GED	3,522	19%
Some college	4,776	16%
MARITAL STATUS		
Never married	3,704	24%
Ever/currently married	6,295	15%
EMPLOYMENT STATUS		
Never worked	674	18%
Ever/currently work	9,326	18%
HOUSEHOLD INCOME		
Under \$20,000	2,516	28%
\$20,000 or more	6,358	15%
NUMBER OF LIFETIME PARTNERS		
None	883	2%
One	2,287	8%
2 to 3	2,195	20%
4 or more	4,453	27%
NUMBER OF PREGNANCIES		
None	2,900	16%
1 to 3	5,281	18%
4 or more	1,846	24%
AGE AT FIRST INTERCOURSE		
Under 16 years	2,373	27%
16 years or older	6,622	17%
REPORTED FORCED SEX ACT		
Yes	1,834	27%
No	8,075	17%

TABLE 3. COMPARISON OF ATTITUDES TOWARD AUDIO-CASI OF INCREASED REPORTING GROUP TO NON-INCREASE GROUP

Reporting Method	Respondents Who Increased Report in Audio-CASI (N = 1,837)	Respondents Who Did Not Increase Report in Audio-CASI (N = 8,149)
Which of the methods do you think lets people give more honest answers?		
Interviewer	11%	11%
Audio-CASI	60%	47%
Doesn't matter	29%	42%
The questions on abortion and the number of sexual partners were asked earlier by the interviewer and just now over the earphones. Were you more comfortable answering these questions when the interviewer asked them or when you heard them over the earphones?¹		
Interviewer	11%	10%
Audio-CASI	53%	34%
Doesn't matter	36%	55%
How likely or unlikely is it that you would have given different answers to some of the questions the interviewer asked you if you could have typed the answers into the computer yourself?		
Very likely/somewhat likely	51%	23%
Not very likely/not at all likely	49%	77%
For all or most of this part of the interview, did you listen to the earphones and read the answers on the screen, listen to the earphones and turn the screen off, or read the screen and turn the earphones off?		
Listened and read	59%	52%
Listened only	4%	2%
Read only	38%	45%

¹Question not asked of virgins. N=1,775 for Increased Reporting Group and 7,307 for non-increase group.