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This paper presents the results of an 803 person experimental pretest of Cycle V of the National Survey of Family Growth (NSFG). The pretest was conducted in six geographic areas using a subsample of women 15-44 who had responded to the 1991 National Health Interview Survey. The impact of three interviewing protocols--in-home CAPI, out-of-home CAPI, and in-home A-CASI-- on abortion reporting was examined. The results showed that both out-ofhome CAPI and in-home A-CASI increased abortion reporting.

Introduction

The National Survey of Family Growth (NSFG) is a periodic survey designed to provide national statistics on issues related to childbearing, family planning, and maternal and infant health. The 1995 NSFG is the ninth in a series of related surveys that date back to 1955. It will be the fifth cycle of the survey conducted by the National Center for Health Statistics (NSFG); the previous four cycles were conducted in 1973, 1976, 1982, and 1988.

The 1995 NSFG will include a national survey of approximately 10,500 women aged 15 to 44. The sample will be selected from households that participated in another NCHS study, the National Health Interview Survey. Topics expected to be covered include education and family background, pregnancy and birth history, marital and relationship history, sterilizing operations and infertility, contraceptive history, birth control and family planning services, birth expectations and desired family size, infertility services, and demographics.

The pretest was conducted in the fall of 1993 to test and evaluate a number of innovations under consideration for the main study. These included computer-assisted personal interviewing (CAPI), audio computer-assisted self-interviewing (A-CASI), conducting interviews with sample women in a "neutral site" outside of their home, and offering case incentives to respondents.

As Dr. Mosher and his colleagues point out in their paper, the decision to switch from paper-andpencil interviewing to CAPI in the 1995 survey was motivated by the desire to improve data quality and timeliness (Mosher, Duffer, and Pratt, 1994). Given the complexity of the proposed questionnaire, it was clear that we had passed the point where high quality data could be collected without computer assistance. Another major concern mentioned in both of the preceding papers is the underreporting of sensitive information in the NSFG, especially abortions (Jobe and Pratt, 1994; Mosher et al, 1994). To address this issue, the pretest included an experiment involving three interview modes that offered differing levels of privacy. The treatments were: (1) a CAPI interview administered in the respondent's home, (2) an in-home CAPI interview followed by a short self-administered A-CASI interview, and (3) a CAPI interview administered at a neutral site.

Under the A-CASI procedure, the interviewer gave the respondent the laptop computer and a set of headphones, and the respondent listened to the questions and entered her responses into the computer herself. In this way, no one in the respondent's household, including the interviewer, could hear the questions or her answers. The A-CASI interview asked about abortions the respondent may have had, including any reported during the CAPI interview. This procedure allowed us to compare the abortions reported by the respondent under both modes.

In the A-CASI implementation, the respondent was first trained to use the computer to enter answers. The interviewer sat next to the respondent while she answered a few completely unrelated questions that gave her practice with all of the types of data that she could be required during the A-CASI interview. This included typing in numbers, answering "yes/no" questions, and choosing items from a list. Then the interviewer moved to a point in the room where she could not see the respondent as she answered questions and the respondent completed the A-CASI section on her own.

The neutral site treatment was introduced to determine whether the reporting of abortions and other sensitive information could be improved by conducting the interview at a site outside of the respondent's home, such as a conference room in a library or office building. The neutral site interviews could then be compared with the other two interview treatments to evaluate the effects of the three privacy levels.

Achieving a high response rate is a major concern for the 1995 NSFG, given the length of the interview (expected to be about 90 minutes), the sensitivity of some of the questions, the plan to conduct a follow-up interview about two years later, and the potential for "gatekeeper" effects (such as spouses or parents who might try to prevent the interviewer from gaining access to the sample woman (Mosher, et al, 1994). Accordingly, the payment of a cash incentive is being considered for the 1995 survey in order to enhance the response rate. To address this issue, the pretest included an experiment involving three incentive treatments: (1) the payment of no incentive for an in-home interview, (2) the payment of a \$20 incentive for an in-home interview, and (3) the payment of a \$40 incentive (plus transportation costs and child care, when applicable) for an interview administered in a neutral site.

To test the effect of these innovations on data quality and data collection costs, the pretest sample was allocated to the following five treatment groups:

- In-home CAPI administration of the questionnaire -- \$0 incentive
- In-home CAPI administration of the questionnaire -- \$20 incentive
- In-home CAPI administration of the questionnaire followed by a short A-CASI interview -- \$0 incentive
- In-home CAPI administration of the questionnaire followed by a short A-CASI interview -- \$20 incentive
- CAPI administration of the questionnaire at a preselected neutral site -- \$40 incentive.

In this paper we analyze the effect of these treatments on the reporting of abortions and other sensitive information. After a brief description of the pretest implementation, we present the results of our analyses, discuss our findings, and suggest areas for future research.

Methods

The pretest was a collaboration of NCHS, Research Triangle Institute, and Battelle Memorial Institute. Preparations began in October 1992 and were completed in September 1993. Interviewers were trained in October and data collection was completed in late December 1993.

The pretest sample was conducted in three pairs of matched sites: (1) New York City and Long Island, NY, (2) Dallas and Austin, TX, and (3) Greensboro/Winston-Salem and Hoke/Moore Counties, NC. A total of 803 women aged 15-44 were selected from households in these sites that participated in the 1991 NHIS. The sample women in each site were randomly assigned to the three interview treatments -in-home CAPI, in-home CAPI plus A-CASI, and neutral site CAPI. For the incentive experiment, all of the in-home respondents in three sites (New York City, Austin, and Hoke/Moore Counties were offered the \$20 incentive, while no incentive was offered to their counterparts in the other three sites . All neutral site respondents were offered an incentive of \$40 and reimbursement of transportation and child-care costs, where applicable.

A multi-stage tracing procedure was implemented for the pretest in order to confirm or update the address information for the sample women obtained from the 1991 NHIS. Tracing procedures included use of the US Postal Service's Change of Address System, central office telephone tracing, data base searches, and field tracing. The tracing effort located 733 of the 803 sample women (91%).

The field data collection was conducted by a staff of 30 interviewers, under the direction of three field supervisors. Due to the subject matter of the survey, all field staff were female. All sample women (and parents of those under age 18) were mailed an advance letter containing information about the study. The standard protocol called for the interviewers to telephone the sample woman to set an appointment for the interview, either at her home or at one of the preselected neutral sites, depending on the interview treatment assigned to the case. Signed consent was obtained from all sample women and from the parents of respondents under age 18. The interview typically averaged between 1.5 and 2 hours to administer. Sample women who refused to be interviewed were normally followed up by another interviewer or the field supervisor in an effort to convert the refusal.

Results

Of the 733 sample women who were located, 16 were ineligible on the basis of age (outside of the target range), sex (not female), out of the country, or deceased. Of the 717 eligible and located subjects, 500 were interviewed (70%). The overall response rate (number interviewed divided by number of eligible cases) was 64% (500/787). For cost reasons, it was decided in the pretest not to interview persons whose current address was more than 120 miles from any of the pretest sites and who spoke only Spanish (we did not want to incur the cost of translating the questionnaire for the pretest since we anticipated significant content changes for the main study). There were a total of 68 cases in these two categories. If these are removed from the denominator of the response rate fraction, the adjusted overall response rate in the pretest was 70% (500/719).

In Exhibit A, we present a descriptive summary which compares the reporting of sensitive characteristics for women who were interviewed in their homes and at a neutral site. In addition, we have

calculated the relative difference between the neutral site reports and the in-home reports. These items were asked aloud by the interviewer in both interviewing locations.

For many characteristics, the reports at the two locations are nearly identical--sometimes higher at the neutral site; sometimes higher for the at-home site. There are, however, four notable exceptions, that is ones in which the relative difference between interviewing locations was 0.25 or greater. These were 1) the reported number of lifetime sex partners, 2) the lifetime incidence of being forced by a man to have sex, 3) the reported lifetime incidence of abortion, and 4) the lifetime incidence of 10 or more sexual partners. In each case higher levels of the activity was reported in neutral site interviews. Thus, there appears to be evidence that interviewing women at a neutral site does facilitate the reporting of sensitive characteristics.

Exhibit B compares the results from the A-CASI question on whether or not the woman had ever had an abortion and both the pilot questions and pregnancy outcome questions in Section B. There was one refusal to the A-CASI question on whether the woman had ever had an abortion in her lifetime so that there are 177 rather than 178 respondents in this second set of A-CASI tables. Six additional women reported having had an abortion at some time in their life in the A-CASI interview. The six additional women represents a 14 percent increase in the number of women reporting ever having had an abortion.

Exhibit C gives detailed information on abortion reporting by site of interview, incentive, and type of interview. Two series of numbers are shown for the ACASI respondents--the number of abortions that they reported in answer to interviewer questions in Section B of the interview and the number reported in subsequent ACASI interview.

In Exhibit D we show the results on the number of abortions reported in Section B and the A-CASI interview for those 178 respondents who completed the A-CASI interview. Women who had reported an abortion in Section B reported additional abortions in the A-CASI interview. All of the differences in numbers of abortions reported are above the main diagonal indicating that the different numbers of abortions reported in the A-CASI are probably not due to random error.

In order to determine if these observed differences due to interviewing mode were statistically significant, we also fit a series of logistic regression models to the data. As independent variables, we included the type of interview (CAPI only, A-CASI, or neutral site), incentive for in-home interviews (none or \$20), race/ethnicity (Hispanic, black, non-Hispanicnon-black), marital status (married, not married), income (unknown, greater than \$20,000, or other), and age. We used a stepwise selection procedure in which an independent variable that had was significant at the 0.15 level was added to the model. Exhibit E summarizes the results.

Clearly, both the neutral site and the A-CASI increases the number of women who report that they ever had an abortion.

We also asked respondents who received the A-CASI interview their attitudes toward the alternative methods of reporting abortion. Exhibit F presents the results. In general these women felt that the A-CASI procedures was more private and recommended it for use in the national survey.

Discussion

The results clearly indicate that in this experiment the more private interviewing modes yielded more reports of abortion. This agrees with the results that were reported by Jones and Forrest (1992). However, they differ from those observed by Jobe (et al., 1994) that were presented at the beginning of this session. As was noted in their paper, there are several differences in the study populations and the conditions of that could contribute to these differences.

- This study used A-CASI for the selfadministration whereas the Jobe, et al. study used paper and pencil self-administered questionnaires
- The population that Jobe, et al. had available for analysis was restricted to those women who agreed to have their clinic records checked possibly excluding those for whom the more private methods would have had an effect.
- While the population for this study was not a national sample, it was consisted of a sub-set of the women who had participated in the 1992 NHIS which is a national sample. The study population in the Jobe, et al. paper included an area-probability sample from the Chicago area and a clinic sample.
- This study was conducted in the context very similar to that which exists in the NSFG in that the abortion questions were administered in the context of an extensive interview which covered many topics related to pregnancy, child-bearing, contraceptive use, and background. The Jobe, et al. study used a sub-set of the questions that are in the NSFG and included a number of questions on drug use. Thus context of the abortion questions was different in the two studies.

Any one of these differences could have an impact on the fact that the two studies had different results for the abortion reporting. However, the failure to find consistent results is troubling. The basic measurement error model for survey data that was explicated by Hansen, Hurwitz, and Bershad (1961) more than 30 years assumed that the responses to survey questions are a random variables that exist under the general and essential conditions of the survey. If one accepts this assumption, then different survey conditions yield different random variables, and a concomitant conclusion is that one must study survey error under situations that mimic these general conditions because to do otherwise would be studying some different measurement phenomenon. One of the basic tenets of the current emphasis on using laboratory studies and small scale experiments to study survey error is that these types of studies are suitable surrogates for what will be observed in the field (Lessler and Kulka, 1983). One would like to be able to draw conclusions from these smaller and less expensive studies and be confident that these conclusions are valid in the large-scale survey.

The lack of consistency in these results reemphasizes that it is very important to consider the conditions of measurement. It is not surprising that this is true, however. When we attempt to measure sensitive issues in a survey, the responses that we elicit by asking questions of respondents are subject to very complex cognitive and psychological processes. Measurement of such relatively simple to measure characteristics have also been repeatedly shown to be subject to the conditions of measurement. The fundamental gas laws from physics are, essentially, a set of rules that lay out how the an easily measurable characteristic such as the volume of a gas varies with temperature and pressure. Thus, we can expect to find that we still have much more to learn about how the conditions of measurement affect survey results.

REFERENCES

Jobe, J.B. and W. F. Pratt. "Effects of Interview Mode on Sensitive Questions in a Fertility Survey." Paper presented a the annual meetings of the American Statistical Association, Toronto, Canada, August 1994.

Mosher, W. D., Duffer, A. P., and W. F. Pratt. "Development and Design of the NSFG Cycle 5 Pretest." Paper presented at the annual meetings of the American Statistical Association, Toronto, Canada, August 1994. Lessler, J. T. and Kulka, R. A. (1983) "Reducing the cost of studying survey measurement error: Is a laboratory approach the answer?" In T. Wright (Ed.) <u>Statistical Methods and the Improvement of Data</u> <u>Quality</u>, New York: Academic Press.

1 While it would have been a better design statistically to randomly assign cases to the \$20 incentive treatment within sites, we were concerned that problems could arise if it became known that respondents in the same site were being treated differently with respect to incentive payments.

2 We also examined the reporting of the number of abortions and found that given a woman had reported an abortion, there were not significant differences in the number of abortions reported.

EXHIBIT A

Summary of Results on Reporting Sensitive Issues by Site of Interview, Relative Difference National Survey of						
Family Growth Cycle V Pretest						
Neutral site Relative						
	Addams Demonstra	Devente	D:00*			

Augusto augusto a fi	At home Departs	Neutral site	Relative		
Average number of:	At-nome Reports	Reports	Difference		
Sex partners in last 12-months	1.2	1.2	0.00		
Sex partners since 1/1/89	1.8	1.9	0.05		
Sex Partners in lifetime	5.2	6.6	0.27		
Sex partners before marriage	4.8	5.2	0.08		
cigarettes/day (current)	14.7	13.1	-0.11		
cigarettes/day (past)	12,8	13.6	0.06		
Age at first sex	17.5	17.5 17.4			
Proportion with:					
Grades in high school 0 or less	0.05	0.05	0.00		
Parent's not living together at Respondent's birth	0.05	0.05	0.00		
Smoked at least 100 cigarettes in life	0.55	0.58	0.05		
Ever forced by a man to do something sexual	0.16	0.22	0.38		
Ever had an abortion	0.21	0.29	0,38		
3 or more partners in last 12 months	0.05	0.06	0.14		
10 or more partners in lifetime	0.15	0.20	0.28		
Had blood test for HIV (other than blood donors)	0.33	0.33	-0.00		
First intercourse was voluntary	0.94	0.92	-0.02		

*(neutral site - at home)/at home

Exhibit B.

Relationship of abortion reporting in the pregnancy outcome section and to abortion reporting in the ACASI interview.

:	Abortion reporte	ed as a birth ne	Total
ACASI: Ever had an abortion	Yes	No	
Yes	42	6	48
No	0	129	129
	42	135	177

Exhibit C: Distribution of the Number of Abortions Reported in Section B by Treatment and Incentive

				In Home						A-CASI					Neutral	
			\$(0	\$2	0	То	tal	\$	0	\$2	0	Та	tal	\$40/T	otal
# of																
abortions	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
0	380	77.1	83	86.5	56	77.8	139	82.7	78	79.6	58	73.4	136	76.8	105	71.4
1	79	16.0	10	10.4	12	16.7	22	13.1	16	16.3	11	13.9	27	15.3	30	20.4
2	24	4.9	1	1.0	4	5.6	5	3.0	3	3.1	9	11.4	12	6.8	7	4.8
3	9	1.8	2	2.1	0	0.0	2	1.2	1	1.0	1	1.3	2	1.1	5	3.4
4	1	0.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total	493	100	96	100	72	100	168	100	98	100	79	100	177	100	147	100
One or more	e abor	tions														
reporte	d in B		13	13.5	16	22.2	29	17.3	20	20.4	22	27.8	42	23.7	42	28.6
One or more	e abor	tions														
reported ir	1 A-C/	ASI							24	24.5	24	30.4	49	27.7		

Exhibit D: Number of Abortions Reported in Section B and in ACASI

			AC	CASI Secti	on		
Section B	0	1	2	3	4	5	DK
0	129	4	1	0	0	0	1
1	0	24	2	1	0	0	0
2	0	0	11	1	0	0	0
3	0	0	0	1	0	1	0
4	0	0	0	0	1	0	0

Exhibit E. Analysis of the impact of characteristics of women and interview conditions on abortion reporting.

			Probability (Chi-	Odds
	Parameter estimate	Standard error	square)	Ratio
Intercept	2.52	0.49	0.0001	1.081
Incentive - 20	0.38	0.27	0.1348	1.488
Married	0.34	0.23	0.1428	0.714
Age	0.03	0.01	0.0264	1.033
A-CASI	0.54	0.27	0.0419	1.723
Neutral site	0.83	0.31	0.00672	2.294

Exhibit F.

Respondents' attitudes toward methods of reporting of abortion; among women who received the A-CASI interview.

How do you rat answers to ques	te telling the interviewers your stions on abortion?
	Percent
Poor	15.2
Fair	20.3
Good	30.5
Very good	17.5
Excellent	16.4
How do you rat earphones to ar	te using the computer and nswer questions on abortion?
Poor	2.8
Fair	8.5
Good	17.5
Very good	26.0
Excellent	45.2
Which method abortion is the	of answering questions on most private?
Earphones and	62.7
No difference	02.7
Talling the	32.2
interviewer	15
Don't know	4.5
Which method study?	do you recommend for the main
Interviewer	16.9
Computer	58.2
Do not ask about abortion	2.8
Does not matter	22.0