

## ESTIMATING THE BIAS IN SURVEY REPORTS OF RELIGIOUS ATTENDANCE

Stanley Presser, University of Maryland, and Linda Stinson, Bureau of Labor Statistics  
Stanley Presser, Sociology Department, University of Maryland, College Park MD 20742

### Key Words: Survey Error, Respondent Misreporting

Hadaway, Marler, and Chaves (1993) recently reported that official counts of weekly attendance at Protestant churches in one rural Ohio county and at Catholic dioceses in several urban counties were only half the level claimed by survey respondents in those areas. Although the discrepancy may be partly due to error in the church counts, survey misreporting is presumably implicated as well, as validation studies of other "socially desirable" behaviors (e.g., voting and contributing to charity) commonly find that respondents overreport them.

Misreporting is usually assumed to stem from errors at either the recall or reporting stages of the question answering process. Respondents may misremember, or they may remember but decide not to report correctly.

If forgetting is key, then providing cues in the question to aid recall should reduce overreporting. Belli, Traugott, and Rosenstone (1995) tested this possibility by asking respondents to think about things that would have been associated with attendance at religious services the previous weekend (such as the weather, mode of transportation, and prayers that took place), before answering whether they actually attended. Counter to the hypothesis, the results were no different from those based on a conventional "unaided" form.

In a similar experiment, Smith (1995) compared a "stand-alone" attendance item with the same item preceded by a series of questions about the respondent's other activities of the past week. Despite the embedding strategy's aim of enhancing recall, a pretest yielded no evidence of reduced misreporting.

These results suggest that the response errors mainly occur not at the recall stage, but at the reporting stage. The problem is apparently not one of forgetting, but of an unwillingness by the respondent to admit to the interviewer he or she did not attend religious services.

This unwillingness might stem from the comprehension stage of the question answering process. Although the problem has not usually been conceptualized in this way, misreporting may involve the way the question is understood. Asking "Did you attend religious services last week?" could be interpreted to mean "Are you a good (Christian/Jew/etc.)?"

If the comprehension stage is key, then reducing misreporting requires an item that does not invoke such meanings. An indirect approach that measures attendance without explicitly mentioning it, would be ideal.

Asking about time-use for a specified 24-hour period is such an approach. Respondents who are asked to report,

in chronological order, everything they did yesterday ought to mention religious attendance if it occurred, but feel no pressure to report it if it didn't, as nothing in the question makes religion salient. Moreover, asking about yesterday should largely avoid recall error.

The time-use study we draw upon was carried out for the U.S. Environmental Protection Agency. It asked a nationwide sample of individuals (both adults and children) to detail everything they did and every place they visited during the preceding day in order to develop estimates of exposure to various sources of pollutants. In this paper, we compare the religious service attendance reported in the time-use survey with that reported to traditional, direct attendance questions in Gallup and NORC surveys conducted during the same period. In addition to developing a better estimate of religious attendance for the nation as a whole (and thereby of the amount of overreport to the direct measurement approach), we examine the impact of overreporting on the correlates of attendance, something not possible in the Hadaway, Marler, and Chaves (1993) study. Thus we can assess the extent to which overreporting compromises research aimed at understanding who attends religious services.

### Methods

Approximately 10,000 time-use interviews were conducted by the University of Maryland Survey Research Center (SRC) from October 1992 through September 1994. Telephone interviews were administered to a two-stage Mitofsky-Waksberg random digit dial sample of the contiguous United States with one respondent selected within households based on the next-birthday method. The overall response rate was 63% (65% excluding nonresponse due to nonEnglish-speaking individuals). Cases were randomly assigned to report about either a weekday (administered Tuesday through Saturday) or a weekend day (administered Sunday or Monday). Only interviews with individuals 18 and older that were conducted on Monday (and therefore asked about Sunday activities) are included in this paper.<sup>1</sup>

We also use two Gallup telephone surveys from the period during which the SRC study was carried out, one conducted March 12-14, 1993, the other June 25-28, 1994. Both were carried out with random digit dial samples drawn from banks of numbers in the contiguous United States that contained at least three published listings. Within households, interviewers asked to speak with the youngest male, 18 or older, who was home, or -- if there was no such person --with the oldest female, 18 or older, who was home.

Finally, we draw on the two NORC General Social Surveys (GSS) conducted during this time period. Both the 1993 and 1994 GSS involved face-to-face interviews with randomly selected adults (18 or older) selected from a multi-stage area sample of U.S. households. Interviews were conducted from February to April, and the response rates (omitting language problems from the denominator) were 82 and 78 percent. We have excluded nonphone households from the GSS to minimize the differences between the surveys. With the very minor exception of the inclusion of Alaska and Hawaii in the GSS sampling frame,<sup>2</sup> the results we present from all five surveys apply to the same population: English-speaking adults living in U.S. households with phones.<sup>3</sup>

Table 1 shows the exact questions asked in these surveys. As is apparent, the time-use approach measures only Sunday attendance, whereas the others tap attendance on all days. We believe that the vast majority of those who attend religious services do so on Sunday, and therefore that the downward bias will be small. For example, synagogue attendance would alter the findings by no more than half of one percentage point (about a quarter of the Jewish respondents in the GSS claim weekly attendance, and Jews are 2 percent of the total population). We will be able to estimate the size of the bias (the percent of the population that attends services on a day other than Sunday and does not also attend on Sunday) when the 1996 GSS becomes available, as it includes an item asking "On what day or days did you attend religious services during the last seven days?"

As can also be seen in Table 1, the SRC and first Gallup item pose yes/no queries about a particular week, whereas the GSS and second Gallup item ask about frequency of attendance in general. In order to make the data comparable we assigned probabilities of attendance to each of the frequency response categories. Details of the conversion using the combined 1993-1994 GSS are provided in Table 2. For example, "every week" was assigned a probability of 1.0; "nearly every week," 0.75; and "several times a year" or less, a probability of zero. These weights seem conservative to us, and therefore should produce a downward bias.

## Results

Table 3 presents results from the five surveys. Despite differences among the Gallup and GSS items, all the direct estimates are quite similar. At least in these cases, no matter how one directly asks about religious attendance, approximately four in ten respondents claim to attend in any given week. By contrast, the indirect approach suggests that only about one in four individuals actually attends. Thus ignoring the nonSunday attendance problem, social desirability bias seems to lead to roughly a 50% increase in attendance reports.

A key concern is whether this bias leads to errors in

modeling the characteristics of religious attenders. That is, are inferences about who regularly attends services affected by the measurement error in the direct items? To answer this question, we examined the relationship between our measures of religious attendance and the six respondent background characteristics that were available on all the surveys. Given their similarity, we combined results from the two GSS years and likewise from the two identical Gallup items.

As others have reported (e.g., de Vaus 1984), women are more likely than men to claim attendance to the Gallup and GSS items. Despite the overreport bias, the identical conclusion emerges from the time-use measure. In other words, sex appears unrelated to the propensity to overreport (Table 4).

The Gallup and GSS results also replicate past findings that older people are more likely to claim regular attendance (Hout and Greeley 1987) and that southerners and midwesterners are more apt than those in the northeast and west to say they attend regularly (Chalfant and Heller 1991). Again, however, the relations are exactly the same in the time-use data, suggesting that region and age are unrelated to overreport bias (Tables 5 and 6).

The finding of no difference by measurement approach is repeated with education, but in this case there is no association in any of the surveys (Table 7).

Consistent with prior work (Glenn and Gotard 1977), Gallup and GSS reveal higher attendance for blacks than whites, though the effect does not reach statistical significance for one of the two Gallup questions. As before, the bias seems unrelated to race, as the SRC data also show higher attendance among blacks (Table 8).

The remaining background variable asked on all the surveys, Hispanic ethnicity (unfortunately religious affiliation was not included on the time-use study), is the only one that behaves somewhat differently across the measurement approaches. It is not significantly related to attendance using any of the direct questions, yet is just significant ( $p < .05$ ) in the SRC data (Table 9). It is possible that Hispanics, who apparently attend services more regularly than nonHispanics, feel less need to exaggerate their observance, but the small number of cases on which this finding is based makes us hesitant to make too much of it.

## Conclusions

If results from the 1996 GSS question that we described above verify our suspicion about nonSunday attendance, the findings presented here confirm the conclusion of Hadaway, Marler, and Chaves (1993) that there is significant overreporting of religious attendance in traditional surveys. The overreport, however, is only about half as large as they suggest (50 percent as opposed to 100 percent). Even more reassuringly, overreporting generally does not seem to affect conclusions about the demographic

correlates of attendance, which is a major use of such data. Thus, despite the considerable bias it engenders, the conventional survey measurement approach appears quite robust.

### Notes

John Robinson, principal investigator of the EPA study, and Timothy Triplett provided assistance in the preparation of this paper, and Tom Smith commented on an earlier draft.

1. More interviews were completed Mondays than Sundays (1,466 versus 961). With the exception of religious attendance, the Monday interviews do not differ by more than 2.0 percentage points from the total weekend sample on any of the variables used in this paper.

2. It is not appropriate to delete the small number of GSS cases from Alaska (there are none from Hawaii), as they were drawn from a stratum that included part of the western continental U.S. in addition to Alaska and Hawaii.

3. There is some variation across the surveys in respondent background characteristics. The GSS and SRC samples have almost identical proportions of women (57-58 percent), blacks (11-12 percent), and midwesterners and southerners (60-62 percent), but each of the corresponding Gallup proportions is about 5 percentage points lower. The Gallup and SRC education distributions are almost identical, yet somewhat higher than NORC's (the former have about 11 percent with less than twelve years of school and 37 percent with high school diplomas, compared to 18 and 31 percent in the latter). Likewise Gallup and SRC have the same representation of Hispanics (6 percent), which is somewhat lower than GSS (9 percent). Finally, SRC has a slightly younger sample (14 percent 65 and older) compared to NORC and Gallup (17-18 percent). As will become apparent below, however, these variations cannot account for the differences across the surveys in level of religious attendance.

### References

Belli, Bob, Santa Traugott, and Steven Rosenstone. 1995. "1994 Experiment to Reduce Over-Reporting of Voter Turnout." Memorandum to the NES Board of Overseers.

Chalfant, H. Paul and Peter L. Heller. 1991. "Rural/Urban versus Regional Differences in Religiosity." *Review of Religious Research* 33: 76-86.

de Vaus, David A. 1984. "Workforce Participation and Sex Differences in Church Attendance." *Review of Religious Research* 25: 247-256.

Glenn, Norval D. and Erin Gotard. 1977. "The Religion of Blacks in the United States." *American Journal of*

*Sociology* 83: 443-451.

Hadaway, C. Kirk, Penny Long Marler, and Mark Chaves. 1993. "What the Polls Don't Show: A Closer Look at U.S. Church Attendance." *American Sociological Review* 58: 741-752.

Hout, Michael and Andrew M. Greeley. 1987. "The Center Doesn't Hold: Church Attendance in the United States, 1940-1984." *American Sociological Review* 52:325-345.

Smith, Tom. 1995. "Church Attendance Pretest Report." Unpublished manuscript.

### Table 1: Question Wordings

GALLUP 1993 and 1994a

"Did you, yourself, happen to attend church or synagogue in the last seven days, or not?"

GSS 1993 and 1994

"How often do you attend religious services?"  
Interviewer code: several times a week, every week, nearly every week, 2-3 times a month, about once a month, several times a year, about once or twice a year, less than once a year, never

GALLUP 1994b

"How often do you attend church or synagogue -- at least once a week, almost every week, about once a month, seldom, or never?"

SRC

"I would like to ask you about the things you did yesterday -- from midnight Saturday to midnight last night. Let's start with midnight Saturday. What were you doing? What time did you finish? Where were you? What did you do next?"  
And so on until midnight Sunday.

Coders coded the verbatim remarks interviewers recorded in answer to the question "What did you do next?" and this paper uses the "Religious Practice" category of the code: "Attending services of a church or synagogue, including participating in the service; ushering; singing in the choir; leading youth group; going to church, funerals, baptism. Individual practice, or religious practice carried out in a small group; praying, meditating, bible study group, visiting graves, Bible reading."

Unfortunately there was no measure of inter-coder reliability. However, the correlation between this variable and the interviewer-recorded answer "Church" to the question "Where were you?" is .96. (Of the 1466 cases, 16 people reported religious activity at a place other than a church, and 5 reported going to a church, but not being involved in religious activity.)

**TABLE 2: GSS 1993+1994 ESTIMATE OF LAST WEEK'S ATTENDANCE**

RESPONSE CATEGORY	MARGINALS	TIMES THE WEIGHT	=	ESTIMATE
Several times/week	8.4%	1.0		8.4%
Every week	20.2%	1.0		20.2%
Nearly every week	5.6%	0.75		4.2%
2-3 times a month	9.1%	0.50		4.6%
About once/month	7.4%	0.15		1.1%
Several times/year	12.2%	0.0		0.0%
About 1-2/ year	13.5%	0.0		0.0%
< once a year	7.9%	0.0		0.0%
Never	15.8%	0.0		0.0%
	$\Sigma= 100\%$			$\Sigma=38.5\%$

**TABLE 3: LAST WEEK'S ATTENDANCE BY SURVEY**

SURVEY	ESTIMATE	2 STANDARD ERRORS	N
Gallup 1993	43%	+/-3%	1,005
Gallup 1994a	41%	+/-3%	1,017
GSS 1993	41%	+/-3%	1,464
GSS 1994	37%	+/-2%	2,774
Gallup 1994b	45%	+/-3%	1,016
SRC	27%	+/-2%	1,466

**TABLE 4: LAST WEEK'S ATTENDANCE BY GENDER**

	Estimate	n	p
Gallup 1993/1994a			
Male	38 %	992	
Female	46 %	1030	< .001
GSS 1993/1994			
Male	33 %	1808	
Female	43 %	2430	< .001
Gallup 1994b			
Male	38 %	488	
Female	52 %	528	< .001
SRC			
Male	21 %	609	
Female	31 %	857	< .001

**TABLE 5: LAST WEEK'S ATTENDANCE BY REGION**

	Estimate	n	p
Gallup 1993/1994a			
North East + West	36 %	891	
Midwest + South	46 %	1131	< .001
GSS 1993/1994			
North East + West	32 %	1702	
Midwest + South	43 %	2536	< .001
Gallup 1994b			
North East + West	38 %	446	
Midwest + South	50 %	570	< .001
SRC			
North East + West	21 %	560	
Midwest + South	30 %	907	< .001

**TABLE 6: LAST WEEK'S ATTENDANCE BY AGE**

	Estimate	n	p
Gallup 1993/1994a			
18-44	37 %	1125	
45-64	47 %	554	
65 +	52 %	333	< .001
GSS 1993/1994			
18-44	34 %	2247	
45-64	40 %	1200	
65 +	49 %	782	< .001
Gallup 1994b			
18-44	38 %	552	
45-64	51 %	282	
65 +	57 %	177	< .001
SRC			
18-44	22 %	824	
45-64	30 %	414	
65 +	43 %	207	< .001

**TABLE 7: LAST WEEK'S ATTENDANCE BY RACE**

	Estimate	n	p
Gallup 1993/1994a			
White	42 %	1791	
Black	47 %	129	n.s.
GSS 1993/1994			
White	37 %	3567	
Black	47 %	493	< .001
Gallup 1994b			
White	45 %	915	
Black	64 %	61	< .001
SRC			
White	25 %	1184	
Black	40 %	151	< .001

**TABLE 8: LAST WEEK'S ATTENDANCE BY YEARS OF EDUCATION**

	Estimate	n	p
Gallup 1993/1994a			
0 - 11	40 %	203	
12	40 %	745	
13 - 15	43 %	496	
16	47 %	283	
17 +	41 %	291	n.s.
GSS 1993/1994			
0 - 11	38 %	743	
12	37 %	1295	
13 - 15	38 %	1082	
16	42 %	627	
17 +	41 %	478	n.s.
Gallup 1994b			
0 - 11	50 %	101	
12	46 %	387	
13 - 15	44 %	236	
16	46 %	145	
17 +	40 %	144	n.s.
SRC			
0 - 11	30 %	169	
12	27 %	534	
13 - 15	29 %	363	
16	20 %	220	
17 +	28 %	180	n.s.

**TABLE 9: LAST WEEK'S ATTENDANCE BY HISPANIC ORIGIN**

	Estimate	n	p
Gallup 1994a*			
Hispanic	35 %	57	
Non Hispanic	41 %	956	n.s.
GSS 1993/1994			
Hispanic	40 %	388	
Non Hispanic	38 %	3674	n.s.
Gallup 1994b			
Hispanic	44 %	57	
Non Hispanic	45 %	955	n.s.
SRC			
Hispanic	37 %	95	
Non Hispanic	26 %	1346	< .05

\*Hispanic ethnicity was not asked on Gallup 1993.