

NONRESPONSES TO INCOME QUESTIONS IN TELEPHONE SURVEYS

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ABSTRACT

The randomness of income nonresponses was examined by using the data gathered from the Florida household survey and the Florida consumer attitude surveys. The results show that the older and less-educated females are less likely to answer the income question than other groups of respondents. Also, less certain and somewhat less optimistic attitudes are expressed by the income nonrespondents.

Introduction

In the conducting of statistical surveys, researchers often face a problem of incomplete responses to some items. The causes and degrees of the item nonresponses vary with the mode of surveys and the type of questions. Problems caused by item nonresponse in mail surveys have been extensively studied by survey researchers (Ferber, 1966; Ford, 1968; Francis and Bush, 1975; Gergen and Back, 1966; Houston and Ford, 1976; Kanuk and Berenson, 1974; and Sicinski, 1970). Along with the popularity of the telephone survey in recent years, the item non-response in the telephone survey has also attracted researchers' attention (Groves and Kahn, 1979; Lansing and Morgan, 1980; and Locander and Burton, 1976).

Groves and Kahn (1979) have found that the amount of missing data due to "don't know" or refused answers is larger in telephone surveys than in personal surveys. Groves and Kahn also examined the types of topics that cause uneasiness in respondents. They found that over one-quarter of the telephone respondents reported feeling uncomfortable about answering questions regarding personal and family income. This report is consistent with the finding of the National Research Council (NRC) in its survey of privacy and confidentiality (1979). NRC's survey revealed that the most disliked type of question in a telephone survey is the income question.

The hypothesis of a high nonresponse rate on the income question in a telephone survey is confirmed by data from Florida's annual household surveys (Shih, 1982). The data show that 17.7 percent of the respondents in the telephone surveys answered "don't know" or refused to answer the question of annual family income.

In spite of the difficulties in gathering income information in telephone surveys, the income variable has been viewed as one of the most important indicators in market analysis and consumer behavior research (Loudon and Della Bitta, 1979; Zaltman and Wallendorf, 1979). Moreover, due to the rising field cost and increasing difficulty of obtaining interviews by personal surveys and the slow and poor response rates of mail surveys (Yu and Cooper, 1983), the telephone survey continues to be popular. As a result, more research on income nonresponse in a telephone survey has become necessary and crucial.

An important question raised by this large amount of missing data is randomness in the data.

If there is no relationship between response behavior and survey respondents' characteristics, attitudes and behaviors, then the sample estimates will not be biased due to missing data. Researchers can simply increase the sample size to make up the missing data. However, if the missing cases are systematically biased to certain character groups, then the missing data will require appropriate estimations (Jessen, 1978; Kim and Curry, 1978).

The purpose of this study is therefore to investigate the income respondents' and nonrespondents' characteristics and attitudes by comparing their responses in telephone surveys.

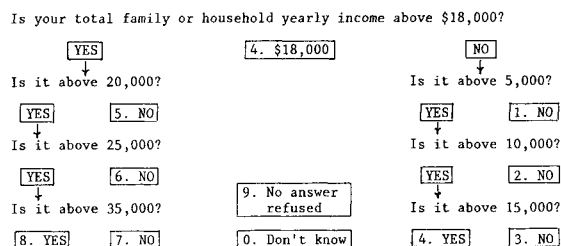
Data and Method

The survey participants who provide the personal or family income information are called income respondents (RSP), and those refusing to answer the question or answering "don't know" to the question are called income nonrespondents (NRS).

The data used in this study came from two types of surveys. One is the Florida household survey (HHS) in 1982 and the other is the Florida consumer attitude surveys (CAS) in 1983. The annual Florida household survey data are used to compare the characteristics of RSP and NRS, and data from the Florida consumer attitude surveys are used to investigate opinions and attitudes for RSP and NRS.

1. The 1982 Florida household survey was conducted during January and February. A total of 1,139 households participated. The sample was selected by the random digit dialing technique throughout the State of Florida. Ten percent of the state's households do not have telephones and were thus excluded from the survey (the 1980 U.S. Census). Survey interviews were conducted between 9:00 a.m. and 9:00 p.m. weekdays. The highest completion rate was found during the evening between 6:00 p.m. and 9:00 p.m. About one out of every three households answering the telephone refused to participate in the survey. The survey collected households' demographic characteristics, household heads' native status, housing units and travel activities. The families' annual income was asked at the end of the telephone interview.

The form of the income question was chosen after review of a study by Locander and Burton (1976). They have examined several ways of asking income questions on the telephone and suggested a series of "family-tree" formats. The question in the Florida household survey is asked as follows:



Two hundred and two households failed to provide the information for this income question. The nonresponse rate was, therefore, 17.7 percent.

2. The Florida consumer attitude survey has been conducted monthly since January, 1983. The data of the January, February and March surveys are used in this study. The totals of completed and usable surveys for those months are, respectively, 360, 506 and 491 households. The aggregated first-quarter data used in this study therefore include 1,357 households. The refusal rate among total households contacted by telephone was 30 percent.

The survey collects information on respondents' personal finances, business conditions in Florida, buying conditions, employment status, mobility and demographic characteristics. As with the household survey, the data are collected through the random digit dialing telephone technique and the family income is asked as a final question.

The format of the income question is different from that in the household survey. Instead of the long process of a "family-tree" question, the respondents were asked to select one of the five income categories read carefully by the interviewers:

The last question concerns your total family income in 1982. I will read income categories, please tell me in which one you belong.

1. First category --less than \$15,000
2. Second category--between \$15,000 and \$19,999
3. Third category --between \$20,000 and \$24,999
4. Fourth category--between \$25,000 and \$34,999
5. Last category --\$35,000 and above
6. N.A.

The nonresponse rate for this question was 10.5 percent.

Findings

1. Demographic characteristics by response behaviors

Table 1 presents the results from the HHS data. The data are grouped into RSP and NRS groups. The respondent's age, sex, education, marital status, household size, type of housing, geographical location and listed condition of telephone are compared and analyzed in Tables 1-a - 1-h. The Chi-square test was applied to test the hypothesis that there is no difference between the two groups in characteristics.

The data show that female respondents are slightly more likely to refuse to offer income information, but the differences are not statistically significant.

Differences in the response behaviors are pronounced by age categories. This finding is consistent with Ferber's (1966) finding in mail-survey-item nonresponse. There is a tendency of older people to answer "don't know" or refuse to answer an income question. Compared to only 11.8 percent of persons aged 44 and younger in the NRS group, more than 23 percent of persons aged 65 and older were in that category.

An interesting finding related to the education factor is that the majority of respondents who refused to answer the years-in-school question also declined to answer the income question. While income and education are closely related in a positive direction, it appears that peoples' response behaviors are also consistent. That is, the respondents who are likely to answer the education question are also more willing to offer their income information. Among those who answer the education question, the college graduates were more likely to respond to the income question.

Respondents' marital status and type of household were found to be a significant factor in the income response behavior. Female-headed-household respondents were much more likely to fail to provide income information than others. A breakdown of the female-headed households shows that widows tend to be nonrespondents more than divorced or separated women. The group least likely to decline the income item were those never married. Compared to 26.5 percent of the widows who did not respond to the question, only 10.9 percent of the never-married persons did not respond (1-d).

Household size and type of housing of respondents were found not to be related to income response behavior (1-e, 1-g).

Geographical differences of the response behavior were observed from the data. Northern Floridians are more like to respond to the question than southerners. While almost 20 percent of the respondents in the southwest and southeast declined to answer the income item, only 11.5 percent of the northern Floridians did so. This may be caused by the fact that northerners are younger, with fewer widows.

It was surprising to find that the listing condition of a household's telephone was not an indicator in the response behavior (1-h). Respondents were asked whether their telephone numbers were listed in the current telephone directories or voluntarily unlisted. The respondents whose telephone numbers were too new to be listed in the directories were not included in the analysis. The hypothesis that unlisted households are more likely to refuse to offer the income information was rejected by the data. On the other hand, the respondents who did not answer the telephone listing question were found to be more likely to refuse to answer the income question.

The above findings indicate that the response behaviors to income questions are not random. Nonresponse to the income question is systematically related to a respondent's demographic characteristics. Sex alone is not a significant factor in the responses, but marital status plus sex showed the most dramatic influence on the income responses. Female-headed household respondents, especially widows, had the highest rate of missing data. Married persons, male-headed households and never-married respondents were similar in their responses.

2. Consumer attitudes by response behaviors

The data from the Florida consumer attitude survey (CAS) were used to investigate the differences between income respondents and non-

respondents on consumer attitudes and opinions. The results are presented in Tables 2-a - 2-m.

Base numbers in each table are different due to the missing cases. The ratio of income refusers was 10.5 percent, which is much lower than the 17.7 percent in the household survey.

This could be caused by two factors. First, the consumer survey had a larger number of terminated cases than the household survey. Since income questions were placed at the end of the questionnaires and the terminated cases were not included in the data analysis, it is possible that those would-be income refusers were excluded in the refusal rate statistics for the consumer survey. It is very likely those terminated respondents would also refuse to offer income information for the same reason--that is, unwillingness to answer financial questions because they are too personal or merely because they lack the knowledge to answer. The second reason is the different format of the income questions. The form used in HHS asked respondents to split at a certain income value and then proceed to the bracket according to the answer. During this long "yes" and "no" process, older respondents might become tired and confused and answer "don't know." Contrary to HHS, the question in CAS is much shorter and simpler. The respondents were simply asked to pick one out of five income categories. Therefore, the "don't know" answers are fewer in CAS. Locander and Burton (1976) have suggested that the form of the income question in HHS helps female respondents to recall total family income, but the age factor was not investigated in their study.

Table 2-a shows that Floridians' perceptions of their current financial conditions compared to a year ago are not associated with their income responses. The majority of RSP and NRS felt that their current financial conditions were either the same or worse than last year. Almost all respondents expressed their feeling on this question; even those income-question refusals had almost a 90 percent response rate about their attitudes.

The question regarding future financial conditions, however, received different responses from income respondents and nonrespondents. While both groups reported considerably optimistic opinions about financial conditions for the next year, a significantly larger proportion of NRS than RSP said they "don't know" (Table 2-b).

These uncertain attitudes from income nonrespondents are even more apparent from the question of "How confident are you about financial expectations?" More than 30 percent of NRS answered they did not know or were not sure of the answer as compared to less than 15 percent of RSP expressing the same uncertainties (Table 2-c).

In terms of opinions about whether income went up more than prices during the past year, two groups showed slight differences. There were more NRS than RSP who reported income had beat inflation. The largest segment in both groups perceived that prices went up more than income. The proportion of "don't know" answers was quite low; while NRS had a higher rate of this type answer than RSP, it was lower than 8.0 percent.

In contrast to this, when respondents were asked their expectations in the next year of

whether income would go up more than prices, some different attitudes were observed in the two groups. More than one-quarter of NRS respondents said they "don't know" what would happen in the coming year, while only 12 percent of RSP respondents said this. Among those who expressed opinions, slightly more optimistic views were reported from RSP.

Opinion on current business conditions in Florida was not found to be strongly associated with income response behaviors. In both groups, about one-quarter of the respondents said business was better than a year ago and about 40 percent said it was worse now. On the other hand, RSP opinions on future business conditions in the state were statistically different from NRS opinions due to the large proportion of "don't know" answers from NRS. Compared to about 15 percent "don't know" respondents in RSP, more than 26 percent in NRS showed this uncertainty. Moreover, income respondents showed more optimism about future business conditions than income nonrespondents (Tables 2-f and 2-g).

For the questions regarding future interest rates and unemployment rates, slightly more pessimistic opinions were expressed by the NRS group. More respondents in NRS perceived that the unemployment rate will go up in the next twelve months than respondents in the RSP group. Again, more uncertain views were expressed by NRS, especially for future interest rates, as more than 21 percent said they "don't know."

Opinions on which condition--unemployment or inflation--would cause a more serious economic problem for people were found to be somewhat different for the two groups. Again, more hesitations were observed in income nonrespondents; more than 25 percent of NRS cited "both equal" or "don't know."

The attitudes toward whether, in general, it is a good time or bad time to buy major household items, a car or a house, were different between the two groups. There were consistently about 10 percent more respondents in the RSP group who said it was a good time to make the three major purchases than respondents in NRS. The proportion of "don't know" answers was also consistently twice as large among NRS than RSP respondents.

Conclusion and Comments

Telephone survey researchers have recognized that the largest amount of missing data results from a personal or family income question. In order to test the hypothesis that income nonresponse is a random phenomenon, the data from the Florida household survey and Florida consumer attitude surveys were separated into income response (RSP) and nonresponse (NRS) groups. The household survey data were used to investigate differences in demographic characteristics between the two groups. The data from the consumer attitude surveys were used to compare income respondents' opinions with those of nonrespondents.

The data show that income response behaviors are not random for certain demographic characteristics and consumers' opinions. While sex alone is not strongly related to income response behaviors, sex together with marital status was

found to be a good indicator of the probable responses. Female respondents who are the head of households are most likely to refuse to answer income questions or to answer "don't know." This is especially pronounced among widows. A respondent's age was also found to be related to income responses. There is a significantly larger amount of missing data on the income question for older respondents than for younger ones.

Education is found to be another indicator of the response behaviors. The respondents in NRS tend to have less education than those in RSP.

In summary, the household survey data indicate that income nonrespondents are overly represented among older and less-educated females who live alone. It is more likely that they belong to a lower-income social group; therefore, the income information collected in the survey will have to be adjusted.

Consumer attitude survey results have shed light on the interesting relationship between income response behavior and consumer's attitude and opinions. The most profound distinction is the degree of certainty about future financial conditions. The income nonrespondents are more uncertain and hesitant about the financial outlook for themselves as well as for the general economy. The second distinction found is that income respondents have a more optimistic attitude than nonrespondents. Given that NRS are more likely older and less educated women, the uncertain and somewhat pessimistic attitudes expressed by this group of respondents are not surprising.

The nonrandomness of income nonrespondents is also suggested by the data from the consumer attitude surveys. Therefore, it is unwise to exclude those nonrespondents by treating them as missing data in survey analysis.

Table 1. Respondents' Demographic Characteristics by Income Response Behavior (percentage)

1-a	Age	RSP	NRS	Total	1-b	Sex	RSP	NRS	Total
	18-44	88.2	11.8	100.0		Male	83.2	16.8	100.0
	45-64	80.4	19.6	100.0		Female	80.5	19.5	100.0
	65 and over	76.6	23.4	100.0		n.s.			
	**								
1-c	Education, Years in School	RSP	NRS	Total	1-d	Type of Household	RSP	NRS	Total
	1-6 yrs.	84.6	15.4	100.0		Husband and wife	83.1	16.9	100.0
	7-12 yrs.	79.6	20.4	100.0		Male-headed	86.1	13.9	100.0
	College and higher	87.6	12.4	100.0		Female-headed (Widow	76.0	24.0	100.0
	N.A.	37.9	62.1	100.0		(Divorced, Separated	73.5	26.5	100.0
	**					Other	80.5	19.5	100.0
						**	89.6	10.4	100.0
1-e	Household Size	RSP	NRS	Total	1-f	Region	RSP	NRS	Total
	1	81.8	18.2	100.0		North	88.5	11.5	100.0
	2	80.4	19.6	100.0		Central	83.1	16.9	100.0
	3	83.2	16.8	100.0		Southwest	79.2	20.8	100.0
	4	86.0	14.0	100.0		Southeast	80.2	19.2	100.0
	5 and over	83.6	16.4	100.0		*			
	n.s.								
1-g	Type of Housing	RSP	NRS	Total	1-h	Telephone	RSP	NRS	Total
	Single family	82.4	17.6	100.0		Listed in directory	82.9	17.1	100.0
	Multifamily	82.9	17.1	100.0		Voluntarily unlisted	85.4	14.6	100.0
	Mobile home	89.9	10.1	100.0		n.s.			
	n.s.								

n.s. = Nonsignificant at 0.05 level in Chi-square table.
 * = Significant at 0.05 level in Chi-square table.
 ** = Significant at 0.01 level in Chi-square table.

2-a. Current Financial Condition Compared to a Year Ago (percentage)

	RSP	NRS
Better	23.1	18.9
Same	45.4	48.5
Worse	30.5	31.4
D.K.	0.9	1.2
Total	100.0	100.0
Base	1189	169
n.s.		

2-b. Expected Change in Financial Condition in the Next Year (percentage)

	RSP	NRS
Better	40.4	31.9
Same	37.0	34.3
Worse	16.9	16.9
D.K.	5.7	16.9
Total	100.0	100.0
Base	1178	166
**		

2-c. Confident About Financial Expectation in a Year (percentage)

	RSP	NRS
Very	45.4	41.6
Moderately	40.1	28.0
Not very	7.2	9.3
D.K.	7.2	21.1
Total	100.0	100.0
Base	1174	161
**		

2-d. Income or Prices Up More During the Last Year (percentage)

	RSP	NRS
Income up more than prices	14.8	16.9
Same	29.4	31.3
Prices up more than income	52.9	44.6
D.K.	2.9	7.2
Total	100.0	100.0
Base	1189	166
*		

2-e. Expected Income or Prices Up More Next Year (percentage)

	RSP	NRS
Income up more than prices	24.5	20.7
Same	28.7	21.3
Prices up more than income	34.9	30.5
D.K.	11.9	27.4
Total	100.0	100.0
Base	1189	164
**		

2-f. Current Business Conditions in Florida Compared to a year ago (percentage)

	RSP	NRS
Better now	27.5	25.6
Same	26.3	21.3
Worse now	36.9	40.9
D.K.	9.3	12.2
Total	100.0	100.0
Base	1188	164
n.s.		

2-g. Expected Business Conditions in Florida Next Year (percentage)

	RSP	NRS
Better	53.2	42.7
Same	17.6	14.6
Worse	14.3	16.5
D.K.	14.9	26.2
Total	100.0	100.0
Base	1188	164
**		

2-h. Expected Change in Interest Rates During the Next 12 Months (percentage)

	RSP	NRS
Go up	23.2	24.2
Same	26.0	14.9
Go down	43.3	39.8
D.K.	7.5	21.1
Total	100.0	100.0
Base	1189	161
**		

2-i. Expected Change in Unemployment During the Next 12 Months (percentage)

	RSP	NRS
Less	37.4	31.5
Same	27.9	24.7
More	30.9	35.2
D.K.	3.8	8.6
Total	100.0	100.0
Base	1189	162
*		

2-j. Unemployment or Inflation More Serious During the Next 12 Months (percentage)

	RSP	NRS
Unemployment	60.8	56.1
Both equal	13.1	15.9
Inflation	23.6	18.5
D.K.	2.5	9.6
Total	100.0	100.0
Base	1188	157
**		

2-k. Is Now a Good Time to Buy Major Household Items (percentage)

	RSP	NRS
Good time	43.1	32.9
Uncertain, depends	13.0	19.4
Bad time	37.7	33.5
D.K.	6.1	14.2
Total	100.0	100.0
Base	1188	155
**		

2-l. Is Now a Good Time to Buy a House (percentage)

	RSP	NRS
Good time	46.8	37.2
Uncertain, depends	8.9	11.5
Bad time	40.6	43.6
D.K.	3.6	7.7
Total	100.0	100.0
Base	1187	156
*		

n.s. = Nonsignificant at 0.05 level in Chi-square table.
 * = Significant at 0.05 level in Chi-square table.
 ** = Significant at 0.01 level in Chi-square table.

2-m. Is Now a Good Time to Buy
a Car
(percentage)

	RSP	NRS
Good time	45.2	36.1
Uncertain, depends	12.6	15.5
Bad time	35.2	33.5
D.K.	7.0	14.8
Total	100.0	100.0
Base	1188	155
*		

n.s. = Nonsignificant at 0.05 level in Chi-square table.
* = Significant at 0.05 level in Chi-square table.
** = Significant at 0.01 level in Chi-square table.

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