

Effect of Interview Length and Proxy Interviews on Attrition to the Survey of Income and Program Participation

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1.0 Introduction

Using exposure risk analysis, this study investigated the relationship between the length of the Survey of Income and Program Participation (SIPP) interview and household attrition over time. Similarly, the study also investigated the relationship between SIPP respondents that gave a proxy interview in a previous wave and household attrition over time. Exposure risk analysis measures the incidence rate for an exposed group in ratio to the incidence rate for an unexposed group.

SIPP is a nation-wide longitudinal survey that provides both cross-sectional and longitudinal estimates. It is sponsored by the U.S. Census Bureau. SIPP collects a wide range of monthly information about all sources of income such as earnings, assets, unemployment compensation, Social Security, food stamps, and other federal and state welfare programs. In addition, SIPP collects extensive demographic and other socioeconomic data. SIPP significantly contributes to our understanding of the social and economic status of the U.S. population and families.

The survey universe of SIPP consists of persons living in United States households and group quarters. Persons living in military barracks and in institutions, such as prisons and nursing homes, are excluded. Each SIPP panel is a multistage probability sample of the survey universe, designed to produce national estimates. A description of SIPP sample design can be obtained from Jabine, King, and Petroni (1990) and SIPP working paper No. 230 (1999). SIPP is a panel survey. In each panel, the members of the sample households are interviewed at 4-month intervals for a total of 8 to 12 waves.

No research has been done on the effect of interview length or use of proxy interviews on attrition rates among respondents to any large Census Bureau surveys. SIPP was chosen because of its lengthy questionnaire. This,

This paper reports the results of research and analysis undertaken by Census Bureau staff. It has undergone a Census Bureau review more limited in scope than that given to official Census Bureau publications. This report is released to inform interested parties of research and to encourage discussion of work in progress.

coupled with the increasing non-response rates in the SIPP survey as a panel ages, drove us to investigate the causes behind attrition. We suspected that the length of each SIPP interview was too burdensome to the respondent, thus causing a respondent to leave the survey. We also suspected that proxy interviewing (giving an interview for another person in the same household) also led to attrition.

Based on research conducted by Bogen (1996), there has been no consistent evidence to suggest that longer interview length or longer questionnaires result in higher non-response rates. Frankel and Sharp (1981) and Sharp and Frankel (1983) reported that interview length did not have a significant effect on subsequent response rates in a panel survey. According to a study by Branden, Gritz, and Pergamit (1995), interview length (time) or long questionnaire length (number of questions) had either no effect or a positive effect on sample retention rates. Contrary to the above two studies, Zabel (1994) reported that attrition rates were reduced after a decrease in interview length.

This study was conducted with the following objectives: 1) to explore the effect of interview length on the attrition rate among SIPP respondents, and 2) to explore the effect of proxy interviews on the attrition rate of SIPP respondents. The exploration was limited to SIPP Panels conducted in 1991, 1992, and 1993. This is a retrospective study and is not a true experiment of the effect of interview length or use of proxy interviews on attrition. The methodology used for this study is based on a relative risk approach as described in Section 3.0. Because this is a retrospective study and not a controlled study, the results may not be fully representative.

SIPP 1991, 1992, and 1993 Panels were individually considered in this study. Only respondents satisfying the following three criteria were included in this study: (1) respondents who were original sample persons (interviewed in the first wave), (2) respondents who gave a self-interview for at least one wave of a panel, and (3) respondents who never belonged to a household that had moved and was not locatable in any wave of a panel. The third criterion was imposed to ensure that the cause of the attrition was associated with a respondent's decision not to participate.

The study has found, based on the relative risk, that (1) people whose interviews were short were much more likely to be attrited than people whose interviews were

either long or extra-long, and (2) although not statistically significant, people who gave proxy interviews seemed to be more likely to be attrited than people who did not give proxy interviews. The results of the analysis are given in Section 4.0. A discussion on the causes underlying the overall findings obtained from this exploratory study is provided in Section 5.0. Additional suggestions for research to further explore the interaction of interview length, questionnaire length, and proxy interviews on attrition rates are given in Section 6.0.

2.0 Terminologies and Definitions

An attrited respondent is a respondent who was classified as either 1) non-interview in any two consecutive waves or 2) non-interview in the last wave of a panel. Based on the SIPP definition, an attrited respondent has a zero panel longitudinal final weight but has a positive panel initial weight.

A non-attrited respondent is a respondent who was not classified as an attrited respondent. By definition, a non-attrited respondent has both a positive panel longitudinal final weight and a positive panel initial weight.

The incident rate is the attrition rate within a cohort of people in a SIPP panel's longitudinal universe.

The interview length was the amount of time taken, in minutes, for an interview in a wave of a panel. This data is collected during normal SIPP processing.

A short interview was an interview length of 25 minutes or less during any wave of a panel.

The Type P unexposed cohort was the cohort of people, in the longitudinal universe of a SIPP panel, who never gave a proxy interview in any wave of the panel.

The Type Q unexposed cohort was the cohort of people, in the longitudinal universe of a SIPP panel, who gave only short interviews throughout the panel.

The long interview exposed cohort was the cohort of people, in the longitudinal universe of a SIPP panel, who gave at least one interview longer than 25 minutes but shorter than or equal to 60 minutes in any wave of the SIPP panel.

The extra long interview exposed cohort was the cohort of people, in the longitudinal universe of a SIPP panel, who gave at least one interview longer than 60 minutes in any wave of the SIPP panel.

The proxy interview exposed cohort was the cohort of people, in the longitudinal universe of a SIPP panel, who gave at least one proxy interview, an interview given by a respondent in lieu of another sampled person in the same household, in any wave of the SIPP panel.

3.0 Methodological Derivation

The methodology used in this study was an exposure-risk analysis. The attrition incidence rate for each of the exposed cohorts and the corresponding unexposed cohorts, *AIR*, (probability of a respondent becoming attrited) is estimated as

$$AIR = \frac{\sum_{i=1}^{N_a} IW_i}{\sum_{j=1}^{N_t} IW_j} \quad (1)$$

where

IW_i = the initial weight of the i^{th} respondent in the cohort under consideration (e.g., type P unexposed cohort), who was attrited.

IW_j = the initial weight of the j^{th} respondent in the cohort under consideration (both the attrited and non-attrited respondents included).

Since we are using the initial weights, the estimate, *AIR*, is calculated for the population.¹

N_a = the total number of respondents (sample persons) in the cohort under consideration who became attrited respondents.

N_t = the total number of respondents in the cohort under consideration (both the attrited and non-attrited respondents included).

Relative attrition risk, *RAR*, is a measure of the relative likelihood of attrition between a respondent in the exposed cohort and a respondent in the unexposed cohort and is defined as

$$RAR = \frac{AIR_{\text{exposed}}}{AIR_{\text{unexposed}}} \quad (2)$$

For example, based on equation (2), the *RAR* of a proxy interview exposed cohort can be expressed as

$$RAR_{\text{Proxy Interview}} = \frac{AIR_{\text{Proxy Interview Exposed Cohort}}}{AIR_{\text{Type P Unexposed Cohort}}} \quad (3)$$

¹ The initial weights were used in lieu of the final weights because an attrited respondent has a zero panel longitudinal final weight. Their initial weight was transferred to an appropriate group of non-attrited respondents during the non-interview weighting adjustment.

Suppose RAR of Proxy Interview = 4, this implies a respondent who gave a proxy interview is 4 times *more likely* to be attrited than a respondent who did not give a proxy interview.

On the contrary, suppose RAR of Proxy Interview = 0.33, this implies a respondent who gave a proxy interview is 3 times *less likely* to be attrited than a respondent who did not give a proxy interview.

All statistical significance tests of the difference between the attrition incidence rate of an exposed cohort and the corresponding unexposed cohort were conducted using the standard errors estimated based on the generalized variance parameters (a and b) provided in the SIPP's Source and Accuracy Statements for SIPP Panels 1991, 1992, and 1993 (Waite).

4.0 Results of Analysis

The results of the analysis for each of the three individual panels (1991, 1992, and 1993) are described and summarized in Tables 1 through 3.

- In Table 1, the analysis results of the long interview exposures were tabulated to include the following information: unweighted counts (UWC), weighted counts (WC), estimates of attrition incidence rates (AIR EST), estimates of the standard errors of attrition incidence rates (AIR SE), and estimates of relative attrition risks (RAR EST).
- Table 2 includes the analysis results of the extra-long interview exposures.
- Table 3 includes the analysis results of the proxy interview exposures.

For the Long Interview Exposure (longer than 25 minutes but less than or equal to 60 minutes), the results are as follows: for Panels 1991, 1992 and 1993 respectively, the relative attrition risk = 0.27, 0.32, and 0.32, i.e., the exposed cohort is 0.27, 3.1, and 3.1 times significantly *less likely* to become attrited than the unexposed cohort.

For the Extra-Long Interview Exposure (longer than 60 minutes), the results are as follows: for Panels 1991, 1992, and 1993 respectively, the relative attrition risk = 0.29, 0.54, and 0.34, i.e., the exposed cohort is 3.5, 1.9, and 2.9 times *less likely* to become attrited than the unexposed cohort. However, these findings are not statistically significant.

For Proxy Exposure the results are as follows: for Panels 1991, 1992, and 1993 respectively, the relative attrition risk = 0.86, 0.85, and 0.91, i.e., the exposed

cohort is 1.2, 1.2, and 1.1 times *less likely* to become attrited than the unexposed cohort. However, these findings are not statistically significant.

5.0 Discussion and Conclusion

Contrary to our expectations prior to this study, people who gave short interviews are much more likely to become attrited than people who gave either long or extra-long interviews. Based on intuition, we believe that people who gave short interviews are more likely to reside in single member or small households which, perhaps, are more likely to become attrited households.

It may be that people willing to take more time in answering the survey feel compelled to be a part of the study for other intrinsic reasons, such as civic duty, vested interest in the results, or finding the survey substantively interesting. Another explanation of this phenomena may be greater rapport between the respondent and the interviewer during longer interviews.

Although not statistically significant, people who gave proxy interviews seem to be slightly more likely to become attrited than people who did not give proxy interviews. Intuitively, we believe that in congruity with the interview length effect, that people who did not give proxy interviews are slightly more likely to reside in small households which, perhaps, are more likely to become attrited households.

The results of this study reveal an aspect of the relationship of interview length and proxy interview with the attrition rate in a longitudinal panel survey such as SIPP. It indicates that longer surveys and proxy interviewing do not generally make respondents less willing to participate in a longitudinal panel survey *per se*. However, this does not rule out that they may be important factors for attrition for some cohorts of respondents.

In conclusion, the results of this study illustrate that the causes of attrition are more complicated than the simple correlation between interview length and attrition. Attrition is not simply attributable to exposure to a long interview or exposure to a proxy interview *per se*. Further investigation into the causes of attrition is necessary.

Our findings are based on our use of the population estimate and the unique SIPP longitudinal definition of attrition. If a similar study was conducted using the raw estimate or a different definition of attrition, the study may yield a different conclusion.

6.0 Suggestions for Additional Analysis

Based on the results of the analysis in Section 4.0 and the discussion in Section 5.0, we recommend the

following further studies:

(1) Determine whether single member or small households are more likely to become attrited than large households.

(2) Determine whether people who gave short interviews are more likely to reside in a single member or small household than people who gave either long or extra-long interviews.

(3) Determine whether people who gave proxy interviews are more likely to reside in larger households than those not subjected to proxy interviews.

(4) Determine whether the age of the reference person affects whether a respondent is more likely to be attrited.

(5) Decouple the effect of the interview length and proxy interview on the attrition rate from the other intrinsic reasons for attrition. The data collected in the existing SIPP panels is likely not adequate for the decoupling. Thus, we may need to directly ask the non-attrited respondents, at the last wave of each future SIPP panel, for their reasons for staying through the end of the panel.

(6) Conduct a controlled experiment studying the effect of interview length and proxy interviewing on attrition. Because a controlled study will be fully representative, it would be of interest to the analytical community.

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TABLE 1 - Analysis Results for Long Interview Exposure

SIPP Panel	Respondents in Type Q Unexposed Cohort						Respondents in Long Interview Exposed Cohort						RAR EST
	All		Attrited		AIR EST	AIR SE	All		Attrited		AIR EST	AIR SE	
	UWC	WC	UWC	WC			UWC	WC	UWC	WC			
1991	5307	32.0×10 ⁶	91	56.7×10 ⁴	0.018*	0.0039	9426	58.0×10 ⁶	46	27.7×10 ⁴	0.048*	0.0015	0.269*
1992	6480	29.1×10 ⁶	159	73.2×10 ⁴	0.025*	0.0041	11442	51.3×10 ⁶	90	41.1×10 ⁴	0.080*	0.0017	0.318*
1993	6339	28.0×10 ⁶	109	48.5×10 ⁴	0.017*	0.0035	11573	51.7×10 ⁶	66	28.9×10 ⁴	0.056*	0.0015	0.323*

* Statistically significantly different at 10% significance level between the exposed and unexposed cohorts in each panel.

TABLE 2 - Analysis Results for Extra-Long Interview Exposure

SIPP Panel	Respondents in Type Q Unexposed Cohort						Respondents in Extra Long Interview Exposed Cohort						RAR EST
	All		Attrited		AIR EST	AIR SE	All		Attrited		AIR EST	AIR SE	
	UWC	WC	UWC	WC			UWC	WC	UWC	WC			
1991	5307	32.0×10 ⁶	91	56.7×10 ⁴	0.0177	0.0039	220	1.36×10 ⁶	1	6992	0.0051	0.0101	0.289
1992	6480	29.1×10 ⁶	159	73.2×10 ⁴	0.0252	0.0041	418	1.87×10 ⁶	5	25209	0.0135	0.0119	0.535
1993	6339	28.0×10 ⁶	109	48.5×10 ⁴	0.0173	0.0035	323	1.44×10 ⁶	2	8462	0.0059	0.0090	0.339

Note: The exposed and unexposed cohorts in each panel are not statistically significantly different at 10% significance level.

TABLE 3 - Analysis Results for Proxy Interview Exposure

SIPP Panel	Respondents in Type P Unexposed Cohort						Respondents in Proxy Interview Exposed Cohort						RAR EST
	All		Attrited		AIR EST	AIR SE	All		Attrited		AIR EST	AIR SE	
	UWC	WC	UWC	WC			UWC	WC	UWC	WC			
1991	7987	49.3×10 ⁶	77	48.4×10 ⁴	0.0098	0.0023	6966	42.1×10 ⁶	59	35.5×10 ⁴	0.0084	0.0023	0.859
1992	9649	43.4×10 ⁶	140	54.6×10 ⁴	0.0126	0.0024	8690	38.6×10 ⁶	113	4.14×10 ⁴	0.0107	0.0023	0.852
1993	9608	4.32×10 ⁶	87	36.2×10 ⁴	0.0084	0.0020	8627	37.8×10 ⁶	90	28.9×10 ⁴	0.0076	0.0020	0.910

Note: The exposed and unexposed cohorts in each panel are not statistically significantly different at 10% significance level.