

## ***Comparing two respondent selection methods in telephone surveys***

### **Technote**

#### ***The problem: How do First Birthday versus First Answer respondent selection processes differ?***

Random calls to households will not produce samples that resemble the general population. The First Answer approach interviews the respondent who answers the telephone, but the resulting samples often over-represent women (since men typically answer telephones less frequently) and under-represent younger adults who are often not available. Weighting the sample corrects these biases.<sup>1</sup>

Some researchers argue that weighting can only correct for a few variables that are easily available in reference databases such as the census. Correcting for age, gender, and income imbalances in the sample does not adjust for unobserved imbalances in variables that may be related to accessibility by phone. To eliminate these hidden imbalances, a common approach is the First Birthday screener, in which the interviewer asks the respondent to identify the household member whose birthday is next. The interviewer asks the respondent to bring this person to the phone or records his/her name for a follow-up call.

The market research industry argues that the First Answer method offers the optimum combination of low cost and accuracy, since researchers can correct deviations between the sample and the population through weighting. Everyone accepts that the First Birthday respondent identification process is theoretically more accurate. The key question is whether the practical differences are sufficient to warrant the extra costs.

#### **Research questions**

The research questions are simple:

- ▶ What differences exist between the samples from First Answer and First Birthday respondent selection?
- ▶ What differences exist for substantive behavioural questions?
- ▶ What is the cost difference in the two methods?

#### **Methodology**

PRA tested these two methods of selecting respondents using a telephone questionnaire. We used a common sampling process (Canadian Survey Sampler) to create two pools of respondents of whom we asked identical questions. The only difference in the two samples is that one used the First Answer method for selecting respondents, the other used the First Birthday method. By tracking the number of interviewer hours needed to reach 400 completed interviews, we obtained a good measure of the relative costs of each method. Appendix 1 presents a description of the method.

## Results: demographics

Please see Table 1 for a comparison of the demographic results generated using the First Answer and First Birthday approaches compared to Statistics Canada census data. As Table 1 shows, no statistically-significant differences exist between males and females, or any other demographic subgroups between the two methods. The table outlines the most commonly and easily-observed differences between the two respondent selection methods.

**TABLE 1**  
**Profile of participants (unweighted)**

	First Birthday (n=402) %	First Answer (n=402) %	1996 Census %
<b>Gender</b>	<b>p=.480*</b>		
Female	49.5%	47.0%	51.4%
Male	50.5%	53.0%	48.6%
<b>Age</b>	<b>p=.184</b>		
18 to 24	6.5%	8.7%	13.1%
25 to 39	31.3%	26.9%	31.0%
40 to 64	44.0%	48.5%	37.5%
65 and older	15.7%	12.7%	18.5%
No response	2.5%	3.2%	N/A
<b>Income</b>	<b>p=.467</b>		
Under \$20,000	10.9%	10.7%	15.8%
\$20,000 to \$35,000	19.7%	19.7%	21.8%
\$35,000 to \$50,000	19.7%	20.1%	20.6%
\$50,000 to \$75,000	12.4%	15.9%	24.5%
Over \$75,000	15.2%	11.7%	17.5%
No response	22.1%	21.9%	N/A

\*Note: To be considered significant in market research studies at PRA Inc., the Pearson Chi Square test is used at the 95% level.

## Observed differences in behavioural questions

Table 2 shows the results of several consumer and media habits questions we asked on this experiment. The answers are very similar (unweighted data) and there are no statistically-significant differences, which shows that:

- ▶ The method of selecting respondents does not alter the results.
- ▶ The weighting process does not misrepresent what respondents said.

It seems reasonable to conclude that the small differences that emerged were the result of the answers that respondents gave in each survey rather than the result of respondent selection methods.

**TABLE 2**  
**Comparison of behavioural questions**

	First Birthday (n=402) %	First Answer (n=402) %
<b>Please tell us which of the following statements best describes your personal buying habits:</b>	<b>p=.870</b>	
I like to be the first to try new products	12%	11%
I like to wait until something is proven	84%	85%
Don't know	5%	4%
<b>In the last 2 months, how often have you attended a live entertainment event?</b>	<b>p=.740</b>	
Never	65%	63%
Once	14%	17%
Twice	12%	11%
Three or more times	9%	9%
Don't know/No response	1%	-
Average number of times	1.3	1.9

\*Note: To be considered significant in market research studies at PRA Inc., the Pearson Chi Square test is used at the 95% level.

## Response rate and cost: call statistics

High refusal rates are the most important challenge facing market research. Table 3 shows the call statistics for the two samples. The First Birthday method clearly adds to the refusal rate and cost. In our experiment, the field operations were 26% higher in terms of time. At current field rates of \$25 per hour, for the small samples we used, the First Birthday method adds \$943 to the cost over the base cost of \$3,537.50 for the First Answer method.

**TABLE 3**  
**PRA First Birthday method versus**  
**First Answer method: call statistics**

Screener method	Completions	Interviewer hours	Average time/survey	Numbers called	Refusals	Refusal rate
First Answer	402	141.50	7	1,782	373	46%
First Birthday	402	179.25	7.5	1,805	452	51%

The telephone interview environment, rather than respondents' manipulation, may be an important source of extra cost associated with the First Birthday method. The respondent may feel uncomfortable if he or she must clarify with the interviewer what is meant by the First Birthday. Even in the case where the First Birthday method is not used, quotas can produce delays and increased costs.<sup>2</sup>

Household selection is only valuable if the results are a more accurate representation of the population. As we show in the experiment, the two respondent selection processes did not produce different samples for unweighted data.

## Differences in response results: demographics and opinions

No statistically-significant differences exist in the demographic results when comparing the First Answer to the First Birthday samples. As a result, compared to the First Answer method, using the 'First Birthday' method does not enhance the sampling process or quality of data since both sets of data need to be weighted in order to accurately reflect the population. Also, no statistically-significant differences exist among respondents using either method in their consumer behaviour and media habits.

## Conclusion

The First Birthday sampling method is not an efficient way to complete a survey. The demographic information can be weighted to accurately reflect the population and the survey results are not distinguishable statistically from the First Answer method favoured by the market research industry.

- <sup>1</sup> Weighting is a commonly-applied algebraic adjustment to increase the representativeness of survey samples.
- <sup>2</sup> For example, the question, "Could I please speak with a male in the household?" may make some respondents uncomfortable when they must respond "yes there is a male in the household," or "no there is not a male in the household," especially with women living alone. Respondents may challenge interviewers on the need to bring a particular respondent to the phone. This requires more time on the part of the interviewer to explain the rationale and can lead a less-experienced interviewer to terminate the call.

**For additional information, please contact**  
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## APPENDIX 1

### Description of Method

#### Methodology

We tested these two respondent selection methods by asking certain questions on consumer habits as well as attitudinal questions concerning a Manitoba corporation. These questions were placed on an Omnibus survey conducted in March 2001. PRA conducted telephone interviews with 804 residents, 18 years of age and over in Manitoba: 402 were surveys conducted using the First Birthday screener and the other 402 were conducted without using this screening criteria.

The respondents were selected by random digit dialing (which allows us to include those with unlisted or new numbers). This technique produces a random sample that includes the highest possible percentage of eligible respondents.

Survey dates	March 27–31, 2001
Sample size – with First Birthday screener	402
Sample size – without First Birthday screener	402
Interviewing method	Telephone
Sample selection	Random digit dialing
Overall approximate error rate (theoretical)	+ 5.0%, 19 times out of 20

#### Weighting

In some cases, when the random sample produces a divergence from Canadian census data, we correct for slight discrepancies in gender, age, and income. For example, since men tend to participate in surveys less frequently than women, and younger respondents are often more difficult to find at home, we re-weight the data to conform more closely to Statistics Canada census data. This reflects standard market research and survey practice. Manitoba is represented according to its population.

Since this technique assigns a percentage “weight” to a respondent, the number of weighted respondents may be slightly different from the total number interviewed.