

The Next-Birthday Method of Respondent Selection

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RECENT and numerous additions to the survey methodology literature, especially in the area of random-digit-dialing, have helped researchers to generate samples of household units for telephone surveys. However, the literature on selecting survey respondents within those household units has not kept pace. In fact, after searching through the standard texts on telephone surveys (see for example, Blankenship, 1977, or Dillman, 1978) researchers might conclude that there is only one method of respondent selection—the Trolldahl-Carter (1964) method.

In the Trolldahl-Carter method, one of four selection matrices which list various combinations of age and sex of household members is assigned randomly to telephone numbers in the sample. Thus, by asking only two questions (How many people 18 years or older live in your household, and how many of them are men?), the interviewer has enough information to select the respondent who is designated at the intersection point on the matrix. This method, which is less cumbersome and more appropriate to telephone interviews than the complete enumeration of the household proposed by Kish (1949), still requires the interviewer to ask potentially sensitive questions early in the interview. For example, two elderly women who live together

Abstract Four procedures for selecting telephone survey respondents within a household unit—Trolldahl-Carter, male/female alternation, next-birthday, and no-selection methods—were compared in a small-sample survey. The data indicate that the next-birthday method is a relatively efficient procedure for selecting a sample that is representative of all household members.

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might be frightened by someone calling and first asking how many adults live in the household, then how many men live there. Further, this method precludes a small percentage of household members from being selected. When Trolldahl and Carter first set up their selection tables, they made the assumption that only two adults of the same sex live in any one household—an older and younger adult of either sex. Actually, this assumption is not always correct, and as a result, between 2 and 3 percent of the population, according to their findings, cannot be selected for the sample. Modifications in the method were subsequently offered by Paisley and Parker (1965) and Bryant (1975).

The simplest alternative to the Trolldahl-Carter method is to interview whoever answers the phone, so long as that person is of the minimum age for the study. While this method has the attractions of being brief and not requiring the asking of potentially sensitive questions early in the interview, experience shows that it generally produces a disproportionately high number of older women, since they are the segment of the population most often at home to answer the phone.

Another method is to alternately ask for male and female respondents. In this method, half the questionnaires are designated for a female respondent and the other half for a male respondent, then telephone numbers are randomly assigned to the questionnaires. A shortcoming of this method is that if there is no adult of the predetermined sex in the household, the interviewer must discontinue the interview, and the number must be eliminated from the sample. Another problem with this method is that it does not take into account age, and therefore often produces a sample with a disproportionately high number of older people, who are more likely to be at home and able to speak to the interviewer.

In this study, we test the next-birthday method, a probability method that does not require enumeration of all household members. In this procedure, the interviewer asks to speak to the adult member of the household who has the next birthday.¹ There appear to be

¹ The next-birthday method is based on the assumption that the assignment of birthdates is a random process. When viewed as a single-stage sampling process, the next-birthday method will not produce a sample in which all household members have an equal probability of being selected. For example, suppose two people, one with a birthday of April 1 and the other with a birthday of April 2, reside within a selected household. If the interview takes place on a randomly selected day, the person with the birthday on April 1 has 364/365 probability of being selected while the person with the birthday on April 2 has only a 1/365 probability of being selected. However, when the next-birthday method is viewed as the second stage of a two-stage sampling process, in which the first stage is completed when the person is born, the method produces an equal probability sample within a household.

several advantages to this method: (1) unlike the Trolldahl-Carter method and the male/female alternation, every household member has an equal chance of being selected; (2) unlike the male/female alternation, no working numbers are wasted—someone in the household has to have the next birthday; (3) unlike no-selection method or the male/female alternation, it should not result in a disproportionately high number of older people because old and young adults have an equal chance of being selected, whether or not they are at home when the interviewer first calls; and (4) unlike the Trolldahl-Carter method, it does not require asking potentially sensitive questions early in the interview.

Method

This study was designed to compare the costs and benefits of the four selection methods and, specifically, to test the efficiency and representativeness of the next-birthday method. A professional interviewing firm conducted a survey of political attitudes in Jefferson and Oldham counties in Kentucky, using the four selection methods outlined above. Telephone numbers were drawn systematically from the Louisville telephone directory and were assigned randomly to questionnaires designated for each of the four methods. Interviewers also were randomly assigned across the four selection procedures to preclude interviewer effect on the data. After a brief introduction, the interviewers used one of the four methods to select a respondent for the interview. Using up to three calls to complete an interview, interviewers contacted 416 households and completed 230 interviews.

Since the questionnaires were identical except for the selection method used, the four methods can be compared on several criteria: (1) completion rate, (2) mean length of time per interview, (3) interviewer training and effects, and (4) the representativeness of the sample produced. It was expected that no one method would emerge as clearly superior in every respect but that researchers armed with the results of this study could better match their research needs and resources with the appropriate respondent selection method.

Results

COMPLETION RATE

The completion rate ranged from 69 percent for the next-birthday and no-selection methods to 41 percent for the Trolldahl-Carter method (see Table 1). Neither of the methods that had the highest

Table 1. Selection Method

	<i>No Selection</i>	<i>Male/Female Alternation</i>	<i>Next- Birthday</i>	<i>Troldahl- Carter</i>
Completion rate	69% (72)	43% (46)	69% (69)	41% (43)
Mean length of interview (minutes)	2.3	2.4	2.6	2.8

completion rate requires asking any questions that might frighten potential respondents, particularly those who are elderly or who live alone. On the other hand, the Troldahl-Carter method relies on questions that might make the respondent suspicious of the interviewer's intentions. "It was as though we were intruding just a little further than they (the respondents) were comfortable with," one interviewer said. "Asking how many adults live in the house and how many of them are men makes the respondents very uneasy, and they often asked us why it was important to know," another interviewer added. Thus, it is likely that the intrusive nature of the Troldahl-Carter method is largely responsible for its low completion rate.

The interviewers also reported that the next-birthday method, despite its high completion rate, caused the respondents some difficulty. However, the difficulty was characterized more by befuddlement ("Gee, I can't remember") than by suspicion. It would seem that trained interviewers could more easily neutralize confusion than suspicion, and perhaps asking for the adult with the last, instead of the next, birthday might help the respondents to correctly remember the information and alleviate the problem.

LENGTH OF TIME PER INTERVIEW

The next-birthday and the Troldahl-Carter methods took longer than the others because a selection statement had to be read for all calls, the respondents had to think for a moment to select the proper household respondent, and often another person had to be called to the phone (see Table 1). Although the more complex selection methods do require slightly more time, the extra seconds do not seem particularly consequential when added to a 15- or 20-minute interview.

INTERVIEWER TRAINING AND EFFECT

While the criteria used to evaluate this aspect of the study are mostly subjective, they are nonetheless important. The professional interviewers had difficulty in mastering the Troldahl-Carter method and reported that they did not like to use it. Their attitude is important because it may have been partially responsible for the high

refusal rate for the Trolldahl-Carter method. Perhaps the interviewers' inexperience with or their dislike for the method was apparent to the respondents. Although some interviewer effect seems possible, what is important is that researchers conducting surveys using inexperienced interviewers probably will have higher training costs and more difficulties with this method than another, less complicated method.

Interviewers had no difficulty in mastering the male/female alternation, next-birthday, and the no-selection methods. They enjoyed using no-selection method the most because it "did not make the respondent uneasy."

REPRESENTATIVENESS OF THE SAMPLES

The major research question here is the extent to which the respondents selected by the various methods represent the demographic characteristics of all people in the households sampled. To achieve this comparison, respondents were asked to supply demographic information about themselves and about the other adult members of their household.

Table 2 compares the percentage differences between the sample of respondents selected by each of the four methods and all the adult

Table 2. Percent Difference Between Demographics of Respondents and Demographics of All Adult Household Members in Total Sample

	<i>Method</i>			
	<i>No Selection (N = 72)</i>	<i>Male/Female Alternation (N = 46)</i>	<i>Next Birthday (N = 69)</i>	<i>Trolldahl- Carter (N = 43)</i>
Sex				
Male	-16	-5	-5	-8
Female	+16	+5	+5	+8
Total	32*	10	10	16
Age				
18-24	-8	+7	0	-12
25-34	+1	-13	+5	-7
35-49	0	-2	-2	0
50+	+7	+8	-3	+19
Total	16	30	10	38*
Education				
Elem.	+3	+8	0	+7
Some h.s.	+4	0	-3	+6
H.s. grad.	-9	-10	+9	-9
Some coll.	+8	+7	-6	0
Coll. grad	-5	-4	+2	-3
Total	29 ^a	29 ^a	19 ^a	25 ^a
Sum of % differences	77	69	39	79

* $p < .05$.

^a Subject to rounding error.

members of all households sampled. The sample produced by the next-birthday method does not differ significantly from the pooled data on sex, age, and education. This is also true for the male/female alternation, but the sum of percentage differences for sex, age, and education is considerably greater than for the next-birthday method. Both the Trolldahl-Carter and no-selection methods produced samples that differed significantly from the total sample of adults. For no-selection method, the greatest difference was for sex. As expected, a disproportionately large number of females were home to answer the phone and consequently to participate in the survey. For the Trolldahl-Carter method, the sample differed significantly by age.

To guard against the possibility that the selection method contaminated the reporting of household composition, the sample of respondents for each method was compared with the household composition of that subsample only. This comparison within subsamples for sex, age, and education appears in Table 3. The data for the next-birthday method do not differ significantly from the data for the available adults in the households and actually are very close for age and education. The fact that the next-birthday method oversampled females (although not by a statistically significant margin) demonstrates

Table 3. Percent Differences Between Demographics of Respondents and Demographics of All Adults in Subsamples by Selection Method

	<i>Method</i>			
	<i>No Selection (N = 72)</i>	<i>Male/Female Alternation (N = 46)</i>	<i>Next Birthday (N = 69)</i>	<i>Trolldahl- Carter (N = 43)</i>
Sex				
Male	-13	-10	-11	+2
Female	+13	+10	+11	-2
Total	26*	20	22	4
Age				
18-24	-4	-1	-1	-7
25-34	-6	-5	+1	+3
35-49	+2	-5	-1	-2
50	+7	+11	+1	+7
Total	19 ^a	22	4	19 ^a
Education				
Elem.	+3	+6	0	+6
Some h.s.	+3	-1	+2	+1
Grad	-6	0	-3	-7
Some coll.	+4	0	+1	+1
Grad	-4	-5	+1	-1
Total	20	12	7 ^a	16
Sum of % differences	65	54	33	39

* $p < .05$.

^a Subject to rounding error.

that all selection methods, regardless of their validity in theory, are limited in practice by inaccurate or untruthful reporting by the respondents. Some interviewers in this study suspected that people answering the phone (who are predominately female) occasionally did not really have the next birthday but completed the interview to save themselves the trouble of figuring out who did have the next birthday. Of course, the problem of inaccurate reporting by respondents is not unique to the next-birthday method.

Finally, data collected from samples that are derived using methods in which household units are a sampling stage often should be weighted before generalizing the data to a larger population. Thus, the data from the next-birthday method should be weighted by household size when there is a possibility that demographic characteristics are not distributed randomly among the various-sized households.

Conclusions

Four methods of selecting telephone survey respondents within a household unit—Trolldahl-Carter, male/female alternation, next-birthday, and whoever answers—were compared in a small-sample survey. Considering the representativeness of the sample selected, there is no statistically significant justification for not using the next-birthday method, and indeed, general comparisons indicate that the next-birthday method was matched or exceeded only by the unrepresentative no-selection method. In sum, the next-birthday method appears to be a relatively efficient procedure for selecting a sample that is representative of all household members.

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