Altering the hold period for refusal conversion cases in an RDD survey

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Introduction

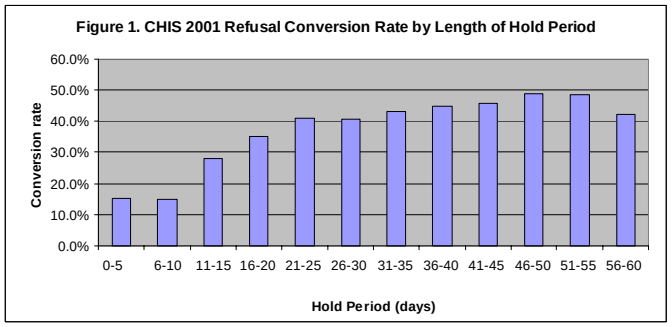
With increasing concern about response rates in telephone surveys, survey organizations are exploring various approaches to ameliorating the overall trend. Not only do lower response rates raise concerns about biased survey estimates, they also increase the cost of data collection for organizations trying to maximize response. Refusal conversion, increasing callback limits, and monetary incentives, among other tactics, can all help to increase response rates, but all can add to the cost of a telephone survey.

One approach to increasing the efficiency of telephone survey operations explored in the literature is call scheduling algorithms that maximize the yield for an initial call or series of calls (Weeks et al, 1987; Kulka and Weeks, 1988; Greenberg and Stokes, 1990; Massey et al, 1996; Brick et al, 1996). Factors evaluated as part of the yield include proportion of attempts yielding completed interviews, proportion of ineligible sample units identified, and cooperation rates. So far as we are aware, there is no published research on the length of hold periods or on optimal call patterns after a refusal is encountered.

In a presentation at the 2003 AAPOR conference, Edwards et al (unpublished) explored the scheduling of calls for refusal conversion in an RDD survey, the 2001 California Health Interview Survey (CHIS), by comparing the day of week and time of day when the refusal occurred and when the first callback after refusal was made. An incidental finding in that research was that the refusal conversion rate increased steadily as the hold period increased up to about three weeks after the initial refusal. (See Figure 1.) However, the length of the hold period was not varied experimentally, so the results may have been due to some factor related to the scheduling operation. In particular, since refusal conversion efforts did not start until 2-3 months into the field period, many of the cases with the longer hold periods had refusals early in the field period. To explore this apparent finding systematically, the 2003 CHIS introduced an experiment that varied the length of the hold period, which is the subject of this paper.

Background – CHIS 2003

Westat conducted the CHIS 2003 under contract to the UCLA Center for Health Policy Research; CHIS is a joint undertaking of UCLA, the California Department of Human Services, and the Public Health Institute. CHIS 2003 was a telephone survey using primarily a random-digit-dial sample stratified so as to provide estimates for California's larger counties and groups of smaller counties. Interviews were conducted with about 42,000 sampled adults, with more than 4,000 adolescents, and with knowledgeable adults about more than 8,500 children in sampled households. Interviews were conducted in English, Spanish, Cantonese, Mandarin, Korean, and Vietnamese. Because of California's diverse population, the RDD sample supports statewide estimates for Latinos, African-Americans, and persons reporting Chinese and Filipino ethnicity[1]. All sampled telephone numbers were screened for business and nonworking status, and then matched against reverse directories to obtain addresses. Of the numbers remaining after the business/nonworking purge, addresses were obtained for 70 percent. Westat mailed a prenotification letter, in five languages, to each of these addresses.



The CHIS screening interview determined whether the sampled telephone number was associated with a household, and identified an adult respondent using a variation of the "last birthday" method described by Rizzo et al (2004). The CHIS adult questionnaire includes questions on general health, health conditions and behaviors, women's health, health insurance coverage, and use of health care services, among other topics. The CHIS 2003 screener response rate was 56 percent, using the survival method to allocate noncontacted numbers to household/nonhousehold status, and the adult interview response rate was 60 percent.

The CHIS data collection protocol included calling back to sampled numbers where a refusal to complete the screening interview was encountered unless the refusal was profane or especially hostile. As a way of increasing the efficiency of the data collection, sampled telephone numbers were subsampled

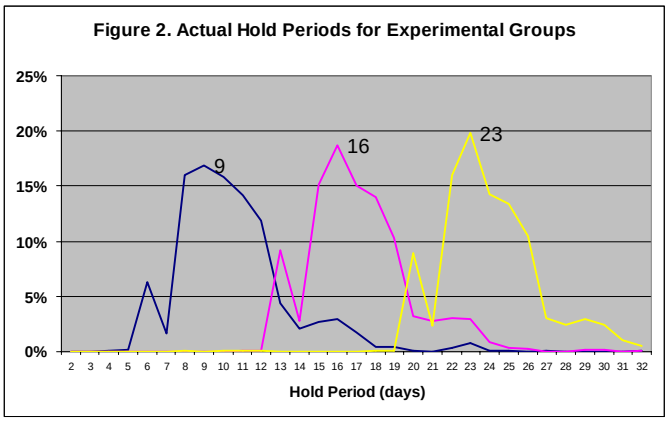
[1] Supplemental list samples were added to the basic RDD design to support statewide estimates for Koreans and Vietnamese. The results presented here are for the RDD sample only, which also included oversampling in some county sub-strata to increase the yield for these groups.

a priori at a rate of 0.6 for screener refusal conversion[2]. These numbers were released to the telephone center before the numbers not designated for conversion. Initial refusals designated for conversion were randomly assigned to hold periods of one, two, or three weeks between the time of the refusal and re-release into the telephone center for conversion. Guided by the analysis from CHIS 2001 data presented in Figure 1, three weeks was set as the default hold period, with 80 percent of the numbers allocated to this treatment. The one- and two-week hold period treatments were each allocated 10 percent of the numbers subsampled for screener conversion efforts[3].

Of the more than 500 interviewers trained for CHIS 2003, those demonstrating superior initial cooperation rates were selected for the refusal conversion. They received additional training in conversion techniques. Conversion attempts began one week into the data collection period for the one-week holds period cases. Refusal cases for which an address had been obtained were sent a second letter via Express Mail before they were re-released for calling. Most second refusals were attempted again after another hold period, which was not experimentally manipulated.

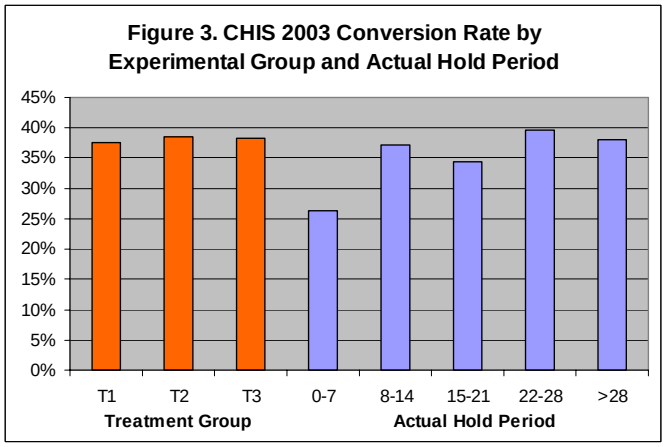
Results

In all, 37,121 initial refusals were called back: 3,869 in the 1-week treatment group (T1), 3,745 in the 2-week treatment (T2), and 29,507 in the 3-week treatment (T3). Because of interviewer availability and other factors, the actual period between the day of the initial refusal and the first callback attempt was usually longer than the minimum. Figure 2 shows



the actual hold periods for the three treatment groups, with the modal periods being 9 days for T1, 16 days for T2, and 23 days for T3. While the distributions of the actual hold periods overlap somewhat across groups, they are very similar in shape and the overlaps are only in the tails of the distributions.

Overall, 38 percent of the initial refusals that were called back eventually yielded a completed screening interview. The first set of bars in Figure 3 compares the conversion rate[4] for each of the three treatment groups. There is essentially no difference among the groups, with T1=37.6 percent, T2=38.6 percent, and T3=38.2 percent. Thus, the hypothesis that a longer hold period would result in a higher proportion of conversions is not supported by the experiment.



The second set of bars in Figure 3 presents the conversion rate by actual hold period. While the bars are somewhat more different than those of the treatment groups, if we disregard the 0-6 day period, which consists of less than 1 percent of all cases, there is no trend apparent. Similar results (not shown) were found when using the cooperation rate for the first callback only or the response rate for the adult interview as the dependent variable, and when examining the eventual yield from the converted cases in terms of adult respondent demographic characteristics. Thus, there appear to be no effects on the data collection results from manipulation of the hold period between the initial refusal and the first attempted callback.

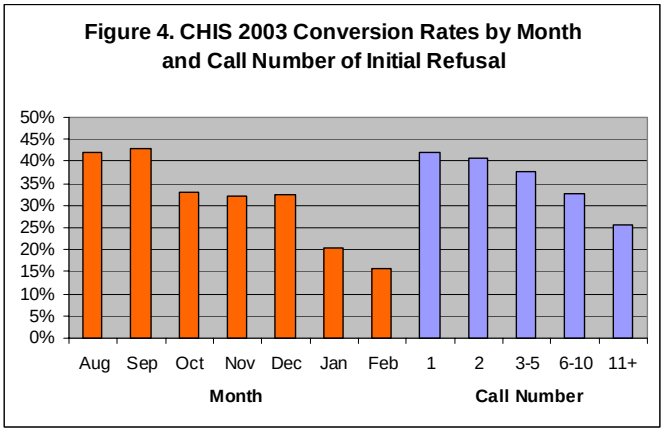
This analysis does not explain why the CHIS 2001 results appeared to indicate that there was such an effect, so we went further into the CHIS 2003 data. Since the longer hold periods, which were associated with higher conversion rates, were concentrated earlier in the field period in CHIS 2001, we examined the CHIS 2003 results by which month in the field period and on which call number the initial refusal occurred. The results are shown in Figure 4. The first set of bars shows

[2] All cases were eligible for refusal conversion at later stages of the interview process (adult, child, and adolescent interviews).

[3] In practice, since refusals were generally not called back on the same day of the week that the refusal occurred, the minimum hold periods were 6 days, 13 days, and 20 days.

[4] The "conversion rate" is the number of completed screening interviews ultimately obtained for the re-fielded initial refusals divided by the number of refusals re-fielded.

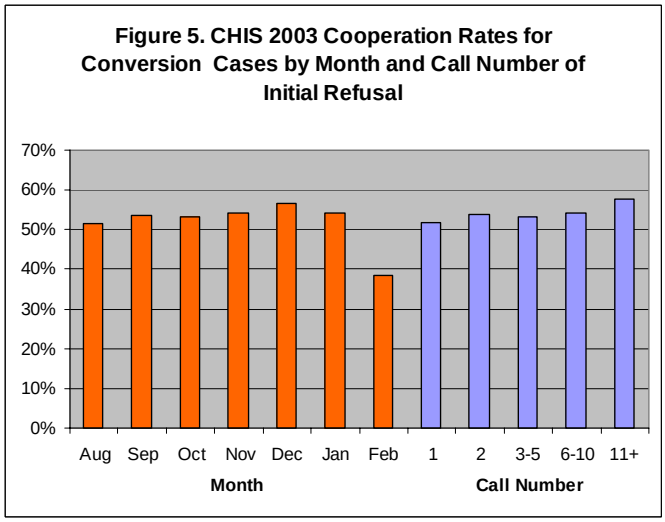
the conversion rate for initial refusals in each month of the field period. A stair-step pattern emerges, as Months 1 and 2 (August and September, 2003) are over 40 percent conversion, Months 3-5 (October-December, 2003) are around 33 percent, and Months 6 and 7 (January and February, 2004) fall near and below 20 percent. As shown in the second set of bars in Figure 4, the pattern for number of the call on which the initial refusal occurred shows a smoother decline, with 42 percent conversion for first-call refusals, 41 percent for second-call, down to 26 percent for calls 11 and higher. There is thus clearly some temporal effect, but its cause is not readily apparent.



We also examined the cooperation rate for initial refusals that were called back. The cooperation rate is the number of eventual completed screening interviews divided by the number of completed interviews plus those that wound up refusing again as their final status. Figure 5 shows the cooperation rate by month and call number of the initial refusal. With the exception of Month 7, in which there were only 68 initial refusals called back, both sets of bars show a slight increase in the cooperation rate over time, the opposite effect of that in Figure 4 for the conversion rate. Thus, the effects shown in Figure 4 are due to nonresponse other than refusal (predominantly noncontact) in the callback attempts.

Discussion

This paper has described an experimental manipulation of the time between an initial refusal and the first attempt to convert that refusal to a completed screening interview in an RDD telephone survey, the CHIS 2003. Based on some incidental analysis of the CHIS 2001 data collection, it appeared that refusal conversion efforts might be more successful if the hold period were three weeks or longer, as compared with one to two weeks. There is no evidence from the experimental treatment that this hypothesis is true.



Further exploration of the CHIS 2003 results indicates that refusals occurring earlier in the field period and on earlier calls are more likely to be converted to a completed screening interview. This relationship is due to increased levels of other nonresponse, typically noncontact, for the later cases, as the overall cooperation rates for conversion calls do not show a similar decline for later initial refusals.

The relationship between higher conversion rates for earlier calls and for the early months of the field period shown in Figure 4 makes sense given the pattern of fielding new cases in CHIS 2003. In the first two months of the survey, the majority of early calls were made to cases designated for refusal conversion; initial refusals from these months had the highest conversion rates. Some new sample was introduced in the middle three months as the early released cases without contact continued to be called; the conversion rate for refusals occurring in these months was moderate. No new cases were released during the last two months. Thus, the call number seems to be the driving factor behind the temporal drop-off in conversion rates, not the month of the field period. Further, it makes intuitive sense that higher levels of noncontact on conversion calls would be associated with initial refusals on later calls, since the refusal would often be preceded by multiple noncontact calls.

Conclusions

This research found no relationship between the length of the hold period after an initial refusal for an RDD screening interview and the success of conversion follow-up, with hold periods ranging from one to three weeks. The generalizability of this finding is limited by a number of factors: only one research organization conducted the survey, the sample was entirely in California, the screening interview included only a minimal set of questions to determine household status and identify an adult respondent, etc. However, it seems unlikely that altering the hold period would prove to be a significant

factor in improving response rates under different circumstances.

References

Brick, J.M., B. Allen, P. Cunningham, and D. Maklan (1996). "Outcomes of a calling protocol in a telephone survey," *Proceedings of the Section on Survey Research Methods*, American Statistical Association, 142-149.

Edwards, W.S., C. DiSogra, and W. Yen, (unpublished) "Scheduling calls for refusal conversion in an RDD survey," presentation at the Annual Conference of the American Association for Public Opinion Research, St. Petersburg Beach, May 2003.

Greenberg, B.S., and S.L. Stokes (1990), "Developing an Optimal call scheduling strategy for a telephone survey," *Journal of Official Statistics*, 6 (4), 421-435.

Kulka, R.A., and M.F. Weeks (1989), "Toward the development of optimal calling protocols for telephone surveys: a conditional probabilities approach," *Journal of Official Statistics*, 4 (4), 319-332.

Massey, J.T., C. Wolter, S.C. Wan, and K. Liu (1996), "Optimum calling patterns for random digit dialed telephone surveys," *Proceedings of the Section on Survey Research Methods*, American Statistical Association, 485-490.

Rizzo, L, J.M. Brick, and I. Park (2004), "A minimally intrusive method for sampling persons in random-digit-dial surveys," *Public Opinion Quarterly*, 68: 267-274.

Weeks, M.F., R.A. Kulka, and S.A. Pierson (1987), "Optimal Call scheduling for a telephone survey," *Public Opinion Quarterly*, 51: 540-549.