EFFECTS OF GRIDOUT PROCEDURES ON RESPONSE RATES AND SURVEY QUALITY

Stephanie Eckman, Colm O'Muircheartaigh, Catherine Haggerty
NORC, University of Chicago, 55 E Monroe, Chicago, IL 60603

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Introduction

An increasing share of cases in RDD surveys remains unresolved after the fieldwork is completed; after repeated calls, we cannot determine whether the telephone number is a working residential number (WRN) or not. While we do not know the working status of these unresolved telephone numbers, there is evidence to suggest that many of them are not WRNs, and that many more would be unproductive even if called repeatedly.

The gridout procedure is a method of reducing costs by cutting back the number of call attempts made to unresolved cases. The gridout procedure can save data collection costs, but before we decide to implement it, we should understand how it will affect response rates and the data that we collect. There may be a trade-off between the cost savings obtained by not pursuing cases and the data obtained by pursuing them

This paper uses data collection from the Annie E Casey Foundation [AECF] *Making Connections* project to demonstrate retrospectively the impact of three different gridout criteria, and explores their impact on costs, response rates and the number of completed interviews. We find that most cases which are unresolved after relatively few calls [the details are given below] either remain unresolved or are otherwise unproductive. Each of the gridout procedures discussed here can reduce costs substantially while having little effect on the number of completed interviews.

Methods

In 2002, NORC began work on the *Making Connections* project for AECF. AECF supports community organizations in inner-city neighborhoods in 10 cities: Denver, Des Moines, Hartford, Indianapolis, Louisville, Milwaukee, Oakland, Providence, San Antonio and Seattle. AECF retained NORC to design and implement surveys in these neighborhoods and in the cities containing them.

NORC conducted two surveys in each of the cities: an in-person survey in the target neighborhood itself and a telephone survey of the surrounding county.

This paper uses the call history dataset for the RDD survey in the first four cities: Denver, Des Moines, Indianapolis and San Antonio. The RDD instrument involved a household roster of adults and children, selection of an adult respondent, and a 30 minute interview. All households with telephones were eligible. All calls were made in the last four months of 2002. We completed approximately 700 interviews in each city. At the time, NORC did not have an autodialer and did not automatically disposition cases: all dispositions were assigned by interviewers.

When cases were first released, they were called only during weekday evenings 5:30-9 (respondent time) and weekends. After seven unsuccessful attempts to complete an interview, cases were moved to the second call schedule, which called them on Tuesdays and Thursdays during the day.

After three months of data collection in the first four sites, the unweighted response rate across the roster and interview was approximately 30%. We were disappointed in this response rate and decided to explore the gridout procedure, a method of identifying cases that are chronic non-contacts and halting further calls. A grid is set up, each cell of which identifies a day/time of call; if every call to a case results in a ring-no-answer (RNA) or a busy signal, and the calls satisfy distribution requirements in terms of the grid, the case "grids out" and is not called again. Grids can differ either in the cells defined, or in the number of calls required in each cell. The cells are typically called *windows*.

This paper compares three different gridout procedures, shown in Table 1; each has three windows, which are:

- weekday, before 5pm;
- weekday, after 5pm;
- weekend.

Table 1: Definition of Gridout Scenarios

Scenario 1	Scenario 2	Scenario 3
All calls RNA or busy	All calls RNA or busy	All calls RNA or busy
Minimum of 6 calls	Called over minimum of 14 days	Called over minimum of 28 days
1 call in each window	2 calls in each window	2 calls in each window

Scenario 1 uses the most lax gridout criteria: a case that receives 6 or more calls, all of which are ring-no-answer or busy, including at least 1 in each window, grids out and receives no more calls. In this scenario, it is possible for a case to gridout in just two days (though in our call history dataset it always took longer, as discussed below).

Scenario 2 requires a two week field period, which allows a family that is on vacation a chance to return and participate in the study. This scenario also requires a minimum of two calls (ring-no-answer or busy) in each of the three windows.

Scenario 3 is the most strict gridout procedure. It requires each case be in the field for at least four weeks before it grids out; a case must also receive at least two calls (ring-no-answer or busy) in each window.

We did not apply the gridout procedure in this data collection effort, so we have a full call history dataset that allows us to retroactively study the effects of the gridout procedure. Applying each of these gridout scenarios to the call history dataset, we can study the different effects that they would have on final case dispositions, field costs and response rates.

Results

Table 2 and Table 3 show the effects that the three different gridout criteria would have had on the case dispositions.

Table 2: Gridouts, by Scenario

	Scenario 1	Scenario 2	Scenario 3
Total Cases	17,702	17,702	17,702
Gridout Cases	1192 (7%)	847 (5%)	522 (3%)

Table 3: Final Outcomes of Gridout Cases, by Scenario

	Scenario 1	Scenario 2	Scenario 3
WRN	19%	13%	9%
Non-WRN	13%	4%	2%
Unresolved	68%	83%	89%
Complete	7	3	2

In the first scenario, we would have gridded out almost 1200 cases, or seven percent of the total cases released. Because we did not use the gridout procedure, and instead kept calling these cases, we can look at their final dispositions. Thirteen percent of the 1200 gridouts became WRNs, 19% finalized as non-working residential numbers (out-of-scope) and 68% were never resolved. Only seven of the 1200 cases produced a completed interview.

The results for the other scenarios are similar. The stricter gridout criteria in Scenarios 2 and 3 led to fewer gridouts; more of the cases that would have gridded out were never resolved.

Table 4 shows the number of calls we made to the gridout cases in each scenario. Looking at the Scenario 2 column, for example, we see that we made more than 15,000 calls to the 847 cases that could have gridded out. We would not have had to make 1/3 (or 5033) of these calls if we had used the gridout procedure. Because we completed three cases from these 847, we can think of these extra 5000 calls as the marginal effort needed to get three completes: we made 1678 calls to these cases for each of the three completes. These 5000 calls represent five percent of all calls made in the study, yet they produced less than .125% of the completed cases.

Table 4: Savings due to Gridouts, by Scenario

	Scenario 1	Scenario 2	Scenario 3
All Calls to gridout cases	20,955	15,376	8,782
Calls saved	11,084	5,033	1,611
per complete	1583	1678	806
% of total calls saved	8%	4%	1%

Table 5 looks more closely at the effort expended to gridout cases. Though Scenario 1 theoretically could gridout a case in just two days, it never took fewer than three days to make the calls in the three required windows. Similarly, Scenarios 2 and 3 often took more calls and days to grid out cases than is suggested by the minimum requirements in Table 1.

Table 5: Time and Calls to Gridout, by Scenario

	Scenario 1	Scenario 2	Scenario 3
Average days to gridout	12	23	31
Range of days to gridout	3-73	15-73	28-73
Average calls to gridout	8	12	14
Range of calls to gridout	6-21	8-27	8-30

In each scenario, some of the gridout cases went on to finalize as WRNs. For those cases,

Table 6 shows how many days these cases needed to gridout and how many days they needed to become WRNs. It took an average of another week or more of calling for gridout cases to finalize as WRNs.

Table 6: Average Days to Gridout and WRN (for gridout cases that finalized as WRNs), by Scenario

	Scenario 1	Scenario 2	Scenario 3
Average Days to Gridout	9	21	31
Average Days to WRN	22	29	37
Average difference in days	13	8	7

Conversely Table 7 looks at the calls that we would not have had to make if we had used the gridout procedure. Table 7 shows that the calls that the three gridout procedures could have saved us were predominantly RNA and busy calls. Of the more than 11,000 calls we could have prevented using Scenario 1, 84% were RNA and 10% were busy. The calls saved with the other scenarios are similarly distributed.

Table 7: Types of Calls Saved, by Scenario

	Scenario 1	Scenario 2	Scenario 3
Calls saved	11,084	5,033	1,611
% of calls saved RNA	84%	87%	81%
% of calls saved busy	10%	8%	13%

Table 8 shows the effect of the gridout procedure on the response rate. All are AAPOR response rate three calculations. The eligibility rate (e) applied to unresolved cases is the fraction of all resolved cases that are WRNs.

Table 8: Effect of Gridouts on Response Rates, by Scenario

	Scenario 1	Scenario 2	Scenario 3
RR1: No gridout procedure	30.9%	30.9%	30.9%
RR2: Gridouts unresolved	31.1%	31.1%	31.0%
RR3: Gridouts out-of-scope	33.4%	32.7%	32.3%

RR1 is the response rate calculated without using the gridout procedure, which is constant across the three scenarios.

RR2 is the response rates that would have resulted if we had stopped calling cases once they met the gridout criteria and had finalized all gridouts as unresolved. RR2 is slightly higher than RR1 under each scenario. When we continued calling the gridout cases, more went on to finalize as WRN than as non-WRN, as is shown in Table 3. These additional WRNs add to the denominator of RR1 and thus make RR1 smaller than RR2. (The numerator of RR2 is decreased by the lost completes, but this has little effect.)

Discussion

It is not clear whether RR1 or RR2 is the more accurate reflection of response rate. The difference between the two is driven by the proportion of resolved cases that are WRNs. As relatively fewer cases are resolved as non-WRNs after the first batch of calls, the estimate of *e* increases with the number of calls. It might be argued however that *e* is an overestimate, and that the degree of overestimation is increased by the additional calls. In any case, the difference is not of substantive significance.

We include the last row of Table 8 for completeness. It is sometimes suggested that it is appropriate to consider gridout cases as ineligible; this row shows what the response rate would appear to be in each scenario if we were to consider cases out-of-scope once they gridout. There is a small increase in the response rate from RR2 to RR3. This increase is due to the fact that the eligibility rate for all gridout cases is essentially set to zero. This procedure is inappropriate. The evidence

from our work (Table 2) shows that a non-trivial proportion of gridded-out cases are actually WRNs (9% for scenario 3, 13% for scenario 2, 19% for scenario 1). Because *e* was already quite low in RR1 and RR2, the effect is not dramatic.

The gridout procedure identifies a set of cases that may not warrant follow-up. It is clear from the above data that using any of the gridout procedures explored above can save many hours of dialing, which translate into lower data collection costs.[1] Of course, using any of the procedures means foregoing some WRNs and some completed interviews. At issue here is the relative cost and benefit of applying them.

Tables 2 and 4 together show the key results. With the most extreme gridout procedure (Scenario 1) only seven completed interviews are lost. In order to obtain these seven interviews we made more than 11,000 calls to almost 1200 cases. Even with Scenario 2, we needed to make more than 5,000 calls to 847 cases to obtain 3 completed interviews.

The impact on the response rate of achieving that handful of completes is trivial; the impact on costs is considerable. Purely in terms of return on expenditure, these additional calls are unjustified.

The numbers given above for days and calls saved due to the gridout procedures are unique to the set up of NORC's phone center in late 2002 and the calling rules used on the Making Connections project. These calling rules were not designed to grid cases out as quickly as possible. Different calling rules could gridout cases faster and with fewer calls.

We had originally planned to analyze the completed interviews obtained by continuing beyond the gridout rules on order to see whether they differed significantly from other completed interviews. The minute number of additional completes rendered any such analysis meaningless.

Though we plan to take advantage of other opportunities to investigate the effect of gridout, this analysis has convinced us that these procedures are cost-effective.

References

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[1] We do not estimate the hours or dollars that could be saved because these are even more sensitive to each call center's technology and practices.