

## Predictive Algorithm and Efficiency

PRO-T-S has been designed to guarantee the maximum throughput at all times given the limitations and guidelines imposed on any particular study. Increases in interviewer productivity are a direct function of many variables including questionnaire length, incidence, sample efficiency and dialing mode. In addition, factors such as numbers of interviewers actively working on a survey, sample availability, acceptable levels of call abandonment, and response rate all influence actual productivity at any time. Because PRO-T-S is able to be integrated with multiple CATI systems simultaneously the efficiencies realized by using our unique dialing algorithm can be seen throughout your entire organization.

### Predictive Algorithm

The survey research data collection model is quite different than the telemarketing mode of operation. A primary goal is high response rates -- the objective is to complete an interview with as high a percentage of the sample as possible. Typically, there are a finite number of sample pieces/telephone numbers; multiple attempts to each sample telephone number, across different days, are made to increase the likelihood of making a contact. In many cases, there are even multiple follow-up attempts to "convert" respondents who initially refused to be interviewed. As one can imagine, the idea of abandoning live respondents and potentially reducing their future willingness to participate is anathema to most professional researchers.

Another major difference between survey research and telemarketing is in the nature of the lists of telephone numbers utilized. Telemarketers typically employ lists of known household numbers, with many of those households selected based on specific characteristics. In contrast, a large proportion of survey research is conducted using random digit dialing (RDD) a statistical method of selecting telephone numbers at random, so that all numbers have an equal probability of being selected -- the objective being to sample all households equally, regardless of whether or not they are listed in the telephone directory or included in the customer/prospect call list.

The difference is fundamental -- survey researchers are employing a probability sample in order to insure responses are representative of the population at large. Not only does this speak to the inherent problems with call abandonment, but also increases the variance of expected call lengths -- these samples include a large number of non-working numbers, non-household numbers, etc. Coupled with short qualification interviews of 15 seconds to 2 minutes and long follow-up interviews of 5 to 30 minutes or more, the ability to predict when interviewers will be available to take another call is, at best, little more than a guess. It is also important to remember that interviewers are often required to complete some paperwork following completion of each interview - editing of responses and open-ended questions.

In short, the goals, objectives and list sources of survey researchers are quite different than those of telemarketers. The PRO- T-S® System offers two unique and heretofore unknown methodologies for increasing research dialing efficiencies. For those surveys, or parts of surveys where predictive dialing has a potential for large productivity gains, our Research Predictive mode represents a different approach to the problem.

Rather than attempting to predict future availability of interviewers, the PRO- T-S® System predicts the dialing outcome distribution. Conceptually, if there are interviewers waiting for a contact, the system computes a probabilistic distribution of calls in progress and the number that can be expected to result in a "live" contact. The control variable in the process is a simple stopping rule, which sets a limit as to the likelihood that the numbers being dialed will result in more live contacts than there are interviewers available. For example, one might set this limit at .001, .0001, or .0000001 (i.e., 1 in 1000, 1 in 10,000, or even 1 in a million odds of making more live contacts than interviewers available).

This algorithm operates in real-time, taking into account the number of dialing in progress, the number of interviewers "waiting", the probability of each sample telephone number resulting in a live contact, the call history for that specific telephone number (e.g., it previously resulted in a contact, or the previous five attempts all resulted in "no answers"), and empirical real-time connect rates.