



## Just How Accurate Is That Survey?

### *The Most Common Sources of Survey Error*

A friend and I were talking about surveys not too long ago and our conversation drifted to the question of just how accurate polls really are. Acknowledging the many pitfalls that can hamper even the best designed study, my friend wondered aloud whether or not it is possible to conduct a truly error-free survey in which there is not even the slightest hint of bias.

This got me to thinking later about the "perfect survey" and what it would take to achieve it. I suppose if someone took double and even triple measures to ensure that every qualified member of a study population was identified, that a very large sample was drawn, that an exceedingly high response rate was achieved, and that each survey question and every survey procedure was heavily scrutinized, then just maybe the claim of a near flawless survey could be made. The problem, however, would be the enormous cost associated with carrying out this unblemished project.

The reality is that all surveys will have some element of imperfection built into the findings due to the inherent errors of sampling as well as other types of bias that result from the limitations of time, money, and other causes. Because of these limits, surveys often become trade-offs between what one is willing to invest and what level of accuracy one is willing to accept. Unfortunately, survey precision can be a matter of what one is able to afford.

But, smart shoppers seemingly always find ways besides cost to get a better deal. Surveys are no different and the answer to more accurate studies lies, to a substantial degree, in the way the project is controlled for error and bias in the four critical areas below.

**Sampling error:** Most surveys rely on collecting data from just a part of the population rather than from everyone. The fact that the attributes of the sample may not be exactly the same as the overall population from which it was drawn introduces sampling error or what is most commonly known as the *margin of error*. Increasing the size of the sample reduces the error rate, but as long as only a portion of the population is polled, sampling error will exist. The good news is that the amount of error can be calculated, unlike other forms of error.

**Non-response bias:** This form of error is due to the fact that all members of a survey sample do not participate in the study. Non-respondents differ from respondents in at least one way - they did not take part in the survey. But in what other ways are they different? The effect of non-response bias depends on the proportion of the sample not responding and the degree to which they are different from respondents. The use of surveys with low response rates should be reconsidered due to the unknown attitudes of the large segment of non-respondents.

**Coverage error:** Bias is introduced into the survey results when some members of a study population are excluded, either intentionally or unintentionally. A good example is the use of a telephone directory to draw a sample for a local public opinion poll. Not represented in the data are the attitudes and opinions of people who choose to have unlisted numbers and those who have moved to the area since the last printing of the directory. The absence of input from both groups will affect the survey's findings.

**Measurement error:** Suppose a survey asked, "How often do you attend sporting events?" The choices are *regularly*, *occasionally*, *rarely*, and *never*. One die-hard sports fan who attends "only" three or four games a month answers *occasionally*. Another person who attends no other events except the Indy 500, and has not missed the race in 30 years, responds *regularly*. Another person who attends several of her grandchildren's soccer, baseball, or basketball games each week thinks the question means college and professional sports and, thus, answers *never*. These are examples of measurement error. Sound question structure can fix this source of error.

Controlling for these four types of errors is crucial in any survey, and no less so in studies where limited time and money force smaller and quicker projects. Doing so will make the difference between an accurate survey and one where the results cannot be trusted.

### Survey Tip

Surveys that will be derived from large study populations (say, 20,000 and above) clearly suggest drawing a sample. Surveys with small study populations (perhaps less than 2,000) lean towards surveying everyone. But for the survey that falls somewhere in between, should you sample or not?

Using these four criteria can help you decide. If 1) *high precision is needed*, 2) *there are numerous sub-groups of the population to be analyzed*, 3) *the budget is of sufficient size and is not a major concern*, or 4) *there is a need to make everyone feel included (often a PR tactic)*, then surveying the entire population may be the best option.

### Did you know...

Despite knowing the safety hazards of driving while talking on a cell phone, a large majority of drivers with cell phones continue to drive and talk at the same time. In a nationwide survey conducted in May by Harris Interactive among 2,085 adults 18 years of age and older, close to three in four (73%) report talking on their phones while driving. Of this group, 67% say they sometimes talk and drive while 6% admit to doing this "all the time." Just over a quarter of those surveyed (27%) say they never talk on their cell phone while driving.

Younger adults are more likely than their older counterparts to use their phones while driving. The survey findings show that 86% of 18 to 29 year olds talk and drive simultaneously compared to just half the number of respondents 61 and over.

The pattern of cell phone use while driving is consistent among most regions of the country. In states that have a law requiring the use of a hands-free device, the percentages for driving and talking are lower.

Source: Harris Interactive

Comments, suggestions and questions related to survey research should be directed to Doug Cox - NCDOT Market Research Manager at (919)733-2083.