



## Validating Survey Results When Response is Low

Larry J. Seibert, Ph.D.  
President – Association Metrics

The three most commonly heard questions that we get from Board members during the presentation of survey results when there is a low response are:

- 1. Since our response rate is low, how do we know that the results are statistically significant?**
- 2. How do we know that the results are representative of our entire membership?**
- 3. How do we know if the non-respondents are like the respondents?**

This paper addresses each of these concerns.

### **1. How do we know that the results are statistically significant?**

From a statistical perspective, the results of the survey will always be statistically significant, but the level of precision (plus or minus percentage) will vary by the number of respondents.

A commonly held misperception is that the level of precision is based on a survey's response rate. We sometimes get questions like "How would the plus or minus percentage change if we improved the response rate from 5% to 10%" or "What response rate do we need to get results that are statistically significant?"

As Table 1 on the following page shows, the level of precision is based on the actual number of individuals surveyed, not the response rate. The greater the number of individuals who complete the survey, the tighter the precision.

**Table 1**

Sampling Error (95% Confidence)	Sample Size n
+/-1%	8762
+/- 2%	2345
+/- 3%	1056
+/- 4%	597
+/- 5%	383
+/- 6%	266
+/- 7%	196
+/- 8%	150
+/- 9%	118
+/- 10%	96

(The sample sizes in this table are based on a population size of 100,000 or more. Populations below 100,000 will reduce the sample size needed to achieve a particular level of precision.)

To illustrate the relationship between sampling error and sample size (number of individuals surveyed), consider the following example. According to the US Census, there were approximately 158 million registered voters in November 2016. Leading up to the 2016 Presidential election, political pollsters reported their poll results with a margin of error of +/- 3% by surveying 1,000 registered voters (see previous table), even though those 1000 individuals represented only 0.0006 % of registered voters. Whether the population is 100,000 or 100 million, the sample size needed for a particular sampling error is the same.

## **2. How do we know that the results are representative of our entire membership?**

Usually the greatest concern Board members have about relying on results when there is a low response, is whether or not the results are representative of the entire membership. One of the most effective ways of alleviating those concerns is by testing the representativeness of the respondents, and then making adjustments to the results if necessary. The following three step process is used to determine representativeness of the sample, determine if adjustments are necessary, and applying appropriate weights to adjust for member types who may be overrepresented or underrepresented in the sample.

### **Step 1 – Determining Representativeness of the Sample**

The first step in validating the survey results with a low response is to determine which member characteristics are found in a significantly higher or lower proportion in the group of respondents than is found in the member population as a whole. Most association member databases contain member-specific information gathered from a variety of sources, such as the membership application and forms on the association’s website that members use to update their personal information or register for events.

For the purpose of illustration, imagine that the membership database contains each member’s birth date (from which age can be calculated) and his/her initial join date (from which membership tenure can be calculated), as well as other pieces of information. Also imagine that this same information is gathered from each survey respondent, either by including questions in the survey, or by retrieving the information from the database as a result of using unique survey links that identify each respondent.

From the age and membership tenure information, the percent breakdown of each age group and each tenure group in the sample and in the population can be calculated. A comparison between the two groups, with stat testing, will show where there are significant differences between the sample and the population. (Even though our example only examines age and membership tenure, this process can be done for every available member characteristic.)

Table 2 below shows what this hypothetical breakdown might look like. The shaded cells indicate where there is a significant difference between the sample and the population.

Notice in the table that there are no significant differences between the sample and the population based on membership tenure. This is a fairly common occurrence. If this holds for every member characteristic tested, then the sample is deemed to be representative of the population and no other tests or adjustments are necessary.

However, there are some significant differences based on age. In this example, members up to age 40 are underrepresented in the sample, and members who are in their 50s or 60s are overrepresented in the sample. The next step in the process is to determine if the underrepresented or overrepresented groups skew the survey results in some way.

**Table 2**

Tenure (Years)	Survey Respondents	Total Membership	Age (Years)	Survey Respondents	Total Membership
0 – 2	20%	22%	Under 31	5%	11%
3 - 5	19%	18%	31 – 40	17%	22%
6 – 10	16%	17%	41 – 50	22%	22%
11 – 20	11%	12%	51 – 60	31%	22%
21 – 30	22%	20%	61 – 70	18%	15%
31 +	12%	11%	Over 70	7%	8%

## Step 2. Determining if Adjustments are Necessary

In our example, there is a smaller proportion of respondents up to age 40 in the sample than found in the membership as a whole, and a correspondingly larger percentage of respondents who are in their 50s or 60s in the sample than is found in the member population. Our first reaction may be to think that the survey results must be skewed. But what if the younger respondents and the older respondents gave exactly the same responses in the survey? What if there is no difference in their survey responses in spite of their obvious age difference?

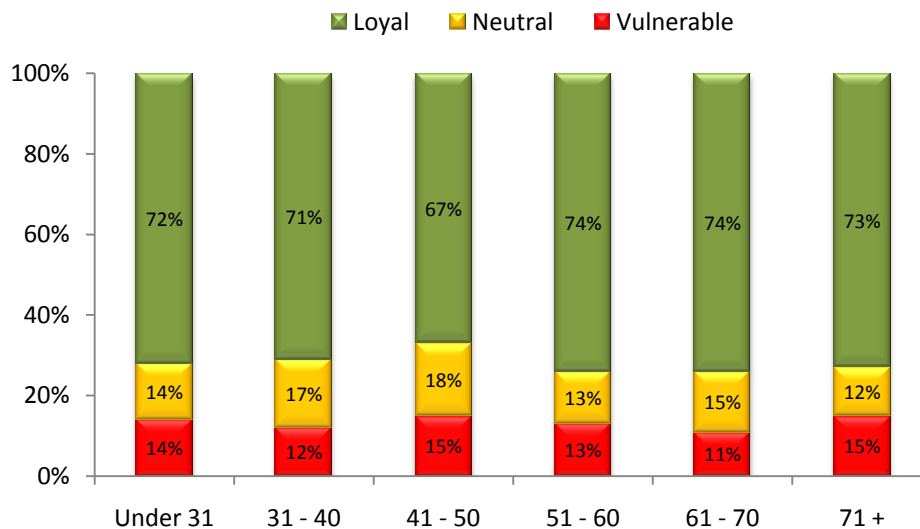
If the responses of these two groups are statistically the same, the results would not be skewed, and no further adjustments are necessary.

In Bar Graph 1 below, the loyalty profiles of each age group of survey respondents are tested to determine if there are any significant differences based on age. In this example, all of the age groups have statistically identical loyalty profiles.

Because members who are in their 50s or 60s have loyalty profiles that are statistically identical to the underrepresented groups, their responses do not skew the overall results, even though they are overrepresented. If the overall loyalty profile for all survey respondents is 73% loyal, 15% neutral, and 12% vulnerable, then we can report these results without having to make any adjustments. Naturally, we will need to include the appropriate margin of error for the sample size.

If we find that there are some statistically significant differences, the next step is to make adjustments by applying weights.

**Bar Graph 1**



### Step 3. Applying Weights

We have found that in most cases, the sample will either be representative on all member characteristics tested, or if not, there will be no significant differences in their responses. In those cases, no further testing and no adjustments are necessary.

However, in other cases where there are segments of the membership that are significantly underrepresented or overrepresented, AND there are significant differences in their responses, weighting is used in the calculations. By adding weights, underrepresented segments can be given additional weight, while overrepresented segments can have their overall influence reduced.

Statistical software packages, such as SPSS, have the option of running analyses with or without weights. Running analyses with weights is fairly straightforward, simply calculate the weight value for each member segment, insert the appropriate value for each respondent into the data set as a new variable, and designate the weight variable when running all analyses.

To calculate a segment's weight value, divide the percentage of that characteristic found in the total membership by the percentage of that characteristic found in the sample. All underrepresented groups will have a weight value greater than one, and all overrepresented groups will have a weight value less than one. Typically, any individual that is missing the information necessary to assign a weight will be assigned the weight value of "1", so that individual's responses are not adjusted.

Table 3 shows the results of the weight calculations for each age segment in our example. Every respondent in a segment will have the same weight value. When using weights it is important to remember that all observations must have a weight value, as the value is used as a multiplier in the analyses.

**Table 3**

Age	Survey Respondents	Total Membership	Weight Value (Total / Survey)
Under 31	5%	11%	2.20
31 – 40	17%	22%	1.29
41 – 50	22%	22%	1.00
51 – 60	31%	22%	.71
61 – 70	18%	15%	.83
Over 70	7%	8%	1.14

### **3. How do we know if the non-respondents are like the respondents?**

While it is not possible to know how non-respondents would have answered survey questions with certainty, some researchers use the responses of reluctant respondents as a proxy for non-respondents. Reluctant respondents can be identified in a variety of ways – here are two examples.

In a survey that is administered only online, all respondents who take the survey during the early days of data collection before any reminder emails are sent, are put into one group. Individuals who complete the survey during the latter days of the data collection, after multiple reminder emails are sent, are placed into the group of reluctant respondents.

Some researchers have used a combination of online surveys with follow up telephone surveys to encourage non-respondents to take the survey. Those individuals who required a personal telephone call to take the survey are placed into the reluctant respondent category.

The responses of the early respondents and the reluctant respondents can be compared using stat testing to determine if there are any significant differences between these two groups. This is done in exactly the same way as comparing the responses of underrepresented groups and overrepresented groups as discussed in Step 2 of this paper.

The comparison of these two groups can be used to validate whether or not there are any significant differences between the groups, or the results of the reluctant respondents can be used as stand alone statistics as a proxy for non-respondents.

#### **Summary**

Survey results are used every day as a basis for business decisions. Board members and Directors should not shy away from survey results that are based on a low response.

The level of precision puts survey results in the proper context based on the number of individuals who completed the survey. Testing for representativeness and using weights if necessary, provide the assurance that the results of the sample will be representative of the member population as a whole.

Even though the responses of the non-respondents can never be known with complete certainty, reluctant respondents can be used as a proxy for non-respondents to eliminate some of the uncertainty.

---

www.associationmetrics.com  
info@associationmetrics.com  
317.840.2303