

Chapter 2

Setting Up an Online Survey Instrument for Effective Quantitative Cross-Tabulation Analysis

ABSTRACT

The building of an online survey instrument involves sophisticated understandings of the research context, research design, research questions, and other elements. A lesser observed need is to consider what types of data analytics will be applied to the findings. With beginning-to-end online survey research suites, it becomes all the more necessary to think through the process from beginning to end in order to create an instrument that achieves all the necessary aims of the research. After all, improper online survey instrument designs will result in makework when it comes time to analyze data and will foreclose on particular data analytics opportunities. (Such instruments also will not have second or third uses after the first one-off.) This chapter explores how to build an effective online survey instrument to enable a quantitative cross tabulation analysis with the built-in analysis Qualtrics.

INTRODUCTION

A basic cross tabulation analysis (aka “contingency table”) is comprised of a data table or matrix in which variables are placed in the column headers and the row headers, and the corresponding intersecting values for those variables are in the respective column and row cells. These tables represent a joint frequency distribution,

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and these “multi-dimensional table(s) (are) used to compare the correlation between two variables (Cross-Tabulation Analysis, 2011, as cited in Lee, Aug. 15, 2015, p. 28) at a time, in a dyadic way. Even two variables being compared may be fairly complex, with scale values in some cases, and other related observations. Multiple variables may be explored at a time in a cross tabulation analysis. At the most basic, a cross tabulation analysis table contains at least two variables, in a 2x2 table. This may be seen in the bolded section at the top left of Table 1.

In qualitative cross tabulation analyses, the intersecting cells may be comprised of frequency counts, common shared terms (words from the respective text sets), or other measures. Some qualitative cross tabulation analyses enable clustering of textual responses to survey (interview, focus group, and others) data by demographic features, responses to particular questions (all those who expressed something), and others.

In a quantitative cross tabulation analysis, the respective intersecting or crossover cells (where the row and column intersect) usually contain a percentage calculation from the observed values / expected values. The “observed values” are the data collected from the research. The “expected values” are calculated based on the potential ranges of values given the numbers of cells (based on the available numbers of variables). The “degrees of freedom” (df) in the construct is calculated based on the number of variables minus one ($n - 1$). The chi-squared calculation is based off of an expected chi-squared distribution that would exist if the null hypothesis is true (only random chance is acting on the observed data and not some other influence). This chi-squared calculation is applied to each cell.

The p-value (probability value) is a threshold value at which the null hypothesis may be rejected, usually at $\leq .05$ or $\leq .01$; the lower the p-value, the rarer the observed data has to be before the null hypothesis may be rejected. A p-value (or “alpha value”) of $< .05$ means that the observed results may fall on either end of the tails of the bell curve distribution at .025 at either end (extreme standard deviations from the center), and a p-value of $< .01$ means that the observed results may fall on either end of the tails at .005. (The assumption of a normal bell curve distribution

Table 1. Depiction of a basic cross tabulation analysis table

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