Tips for Analyzing Quantitative Data

The tips offered here relate to the analysis of questionnaire data as this is the most common source of quantitative data for CLIP inquiries. Descriptive statistical methods provide a means to classify and summarize the numerical data obtained through questionnaires. Inferential statistics may also be needed if the questionnaire is administered to only a sample of the relevant population and you need to make inferences about the population based on what you learned from the sample. For example, if you administered a questionnaire to a random sample of the students enrolled in an introductory math class rather than to all students, inferential statistics would be appropriate.

Administering Questionnaire with Analysis in Mind

If you administered your questionnaire online using services such as SurveyMonkey, Formsite, or other such services, the data may be returned to you as an Excel spreadsheet.

Another possibility is that your college has equipment to scan in your questionnaire and calculate the statistics you need. However, your questionnaire will need to be in a certain format so check first before administering your questionnaire. You may be able to save a lot of time in the analysis of your data by using such services.

Using Descriptive Statistics

If you are administering a questionnaire to a relatively small number of people, say fewer than 50, a spreadsheet program such as Excel can quite easily be used to calculate the average, standard deviation and frequency of responses for each question. Give each respondent a number and record his/her responses to each question as show in the example below. In this example, respondents were given nine questions to answer on a scale from 1 to 5. The first column, "Type" indicates that a 1-5 scale was used. The next column shows the question number. The columns to the far right show the responses by respondent of five individuals to these nine questions. Statistics have been calculated in the intervening columns to show by question the average response, the amount of variation in responses (standard deviation), and the number and percentage of people who gave a particular numerical response.

Type	Q#	Average	Standard Deviation	#of 1s	% of 1s	#of 2s	% of 2s	#of 3s	% of 3s	#of 4s	% of 4s	#of 5s	% of 5s	Total 1s-5s	Questionnaire Respondents (Raw Data)				
															1	2	3	4	5
1-5	1	3.0	1.6	1	20%	1	20%	1	20%	1	20%	1	20%	5	3	5	4	1	2
1-5	2	2.8	1.3	1	20%	1	20%	1	20%	2	40%	0	0%	5	4	4	3	2	1
1-5	3	3.6	1.1	0	0%	1	20%	1	20%	2	40%	1	20%	5	4	5	3	2	4
1-5	4	3.8	0.8	0	0%	0	0%	2	40%	2	40%	1	20%	5	4	5	3	3	4
1-5	5	3.0	1.0	0	0%	2	40%	1	20%	2	40%	0	0%	5	4	4	3	2	2
1-5	6	3.4	0.9	0	0%	1	20%	1	20%	3	60%	0	0%	5	4	4	4	2	3
1-5	7	3.6	0.6	0	0%	0	0%	2	40%	3	60%	0	0%	5	4	4	4	3	3
1-5	8	3.0	0.7	0	0%	1	20%	3	60%	1	20%	0	0%	5	3	3	4	3	2
1-5	9	3.5	0.6	0	0%	0	0%	2	50%	2	50%	0	0%	4	4	3	4		3

If data are being obtained from larger numbers of respondents it will be preferable to work with a statistical analyst who can use a software package such as the Statistical Package for the Social Sciences (SPSS).

Using Inferential Statistics

The accuracy of inferences drawn from a sample is critically affected by the sampling procedures used. It is important to know and be able to identify who is in the population of interest, for example, to identify all enrollees in all sections of the introductory math class not just those from a few sections.

You may want to create subgroups within the population before selecting your sample, for example, creating one subgroup of males and another of females if you think that there may be important differences between those groups in relation to your inquiry question. Make sure that your technique for selecting the sample is random or that each person has the same probability of being selected, whether you are selecting from the entire population or subgroups.

The size of the sample should be appropriate relative to the size of the population. Consult with statistical analysts or texts for information on the formulas for determining sample size.

Examine your sample to be sure it is truly representative of the larger population on critical variables such as gender, age, race, etc.

When you do not have access to the full population, you cannot make generalizations from the sample to the population. However you can still make inferences if you explain how the sample may vary from the population and what potential sources of bias exist. Statistical tests (chi square and the t test) can be used to test the statistical significance or generalizability of relationships between variables.

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