# Data Analysis

Data analysis is a practice in which raw data is ordered and organized so that useful information can be extracted from it. The process of organizing and thinking about data is key to understanding what the data does and does not contain. There are a variety of ways in which people can approach data analysis, and it is notoriously easy to manipulate data during the analysis phase to push certain conclusions or agendas. For this reason, it is important to pay attention when data analysis is presented, and to think critically about the data and the conclusions which were drawn.

Raw data can take a variety of forms, including measurements, survey responses, and observations. In its raw form, this information can be incredibly useful, but also overwhelming. Over the course of the data analysis process, the raw data is ordered in a way which will be useful. For example, survey results may be tallied, so that people can see at a glance how many people answered the survey, and how people responded to specific questions.

In the course of organizing the data, trends often emerge, and these trends can be highlighted in the writeup of the data to ensure that readers take note. In a casual survey of ice cream preferences, for example, more women than men might express a fondness for chocolate, and this could be a point of interest for the researcher. Modeling the data with the use of mathematics and other tools can sometimes exaggerate such points of interest in the data, making them easier for the researcher to see.

Charts, graphs, and textual writeups of data are all forms of data analysis. These methods are designed to refine and distill the data so that readers can glean interesting information without needing to sort through all of the data on their own. Summarizing data is often critical to supporting arguments made with that data, as is presenting the data in a clear and understandable way. The raw data may also be included in the form of an appendix so that people can look up specifics for themselves.

When people encounter summarized data and conclusions, they should view them critically. Asking where the data is from is important, as is asking about the sampling method used to collect the data, and the size of the sample. If the source of the data appears to have a conflict of interest with the type of data being gathered, this can call the results into question. Likewise, data gathered from a small sample or a sample which is not truly random may be of questionable utility. Reputable researchers will always provide information about the data gathering techniques used, the source of funding, and the point of the data collection in the beginning of the analysis so that readers can think about this information while they review the analysis.