Designing Visualizations: The Do's

In this video, you learn some things you might want to do when designing visualizations for communication.

First, let's talk about customizing your visualizations. You might want to use customizations that make it easier for the reader to interpret the graph.

Every software application has its own default settings and styles, and most of the default values and settings used by JMP are very good. However, don't assume that the defaults are the best way to tell your story.

Here are a few things you might want to change: labels for the axes, to make them more descriptive, the scale of the axes, if it makes the graph more informative and doesn't mask, hide, or distort information, markers and marker colors, if it makes it easier to distinguish the different values or see clusters of points, and the color scales, if it makes it easier to interpret the values that the colors represent.

When you're selecting a color scale, it's important to keep in mind accessibility. Some people have a hard time distinguishing between certain colors. For example, people with red-green color blindness have a difficult time distinguishing between reds, greens, browns, and oranges.

It's also important to consider what your graph will look like if it's printed without color ink. Sequential scales are easier to interpret. They are also easier to read if the visualization is printed in black and white. In that case, they display as gray scale.

Using a sequential white-gray-black color scale, changing markers, or changing the fill pattern can also help with accessibility.

However, diverging color scales might be the best choice if you have an explicit middle value. For example, if you are graphing deviations from some value, and your data range from -4 to 4, a divergent scale can be used to highlight the negative and the positive deviations.

Depending on your audience and your channel for sharing the visualization, you might want to add some additional information to the graph.

Here are some things that you might want to add: a legend, if it will help the audience interpret the graph; annotations or notes, to provide context and supporting information; the unit of measure for the variable, if it isn't obvious; the time frame or date range for the data, again to provide context; reference lines, to identify change points or periods of interest; the source for the data, to add credibility; animation, if it helps communicate your story; and background maps, if your data can be plotted geographically.

You might also want to include the sample size or error bars, particularly if the graph is based on a limited amount of data. Error bars show the degree of uncertainty in your data. When you don't have a lot of data, you have a lot of uncertainty.

You learn more about sample size, error bars, and measuring uncertainty in the "Decision Making with Data" module.

If you add additional design elements to a graph, use focus plus context layering. For example, suppose you create a scatterplot, and then you fit a trend (or regression) line to the data. Your focus for the visualization is the trend line, but you want to include the points to provide context. You can use faded colors or transparency for the data points. Your audience will see these points but will focus on understanding the trend line.

Before we move on to the don'ts, here is one final thing to consider. It is likely that you will need to present your findings or conclusions to others to your manager, your project sponsor, or other stakeholders.

You might develop a few PowerPoint slides to help organize your story, but your visual displays of the data are the jewel and centerpiece of your presentation.

HERE IS THE RECOMMENDATION: If you are giving a live presentation, you might be tempted to use static graphs or images. Depending on your audience, you might want to use interactive visualizations instead (with the static graphs as a backup).

This approach has many benefits: it makes the presentation more interesting and dynamic, you can minimize the use of static (and often wordy) PowerPoint slides, and you can easily explore different scenarios, answer questions you hadn't considered, and engage your audience.

Through interactivity, you shift the presentation paradigm. You are no longer speaking to words in a slide deck. You are illustrating your knowledge of the problem and the data, and actively sharing the journey of data discovery with your audience.

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