Designing Effective Tables and Charts: Theory and Practice

ly, youll have better context as you design your own.

to how we communicate the meaning of data. Edward
holars in the field – said “Graphics reveal data.
precise and revealing than conventional statistical
) But graphics can only reveal data if they are well-

u should “design” tables and charts rather than
and charts is easy -- all you need to do is have
a -- but designing them is more complicated. To design
ctively make decisions about who your audience is,
how you can present your data to most effectively

the sensory receptors in our body, 70% reside in our
perceive of the world around us is processed
nderstand” and “I see” are used interchangeably.

nformation visually, we need to understand the
visual perception. For example, the human visual
city to recognize patterns – but only if they are
it has a tendency to misinterpret or completely miss
a non-intuitive way.

he research of Stephen Few and Edward Tufte, we have
ree overarching guidelines: (1) organize the data, (2)
data.

Two simple rules for developing a PowerPoint

(1) Organize the data

Consider your audience and presentation medium

Use the proper format for your purpose

Tables	Charts
x	x
x	x
x	

What type of data are you summarizing?

x

x

x

  o

  o

  o

REVIEW: Before doing any design, you should ask the questions "What's my point?" and "Why does it matter?". These answers, including whether you want to provide exact numbers or patterns and relationships, will guide all your decisions. After identifying the purpose, your presentation medium, and the type of data you have, you're ready to begin the design process.

Want to provide precise values Î Table	Sparse data Î Table
Want to show pattern / relationships of data Î Chart	Dense data Î Chart

What type of chart would be best for my data?

Most data can be presented in any chart format, but there are best practices about what you should use. The purpose of your presentation and the type of data will at least inform if not determine the type of chart to use. The following is a sampling of best practices that was adapted partly from Kosslyn (1994) and Stephen Few.

- Use a stacked-bar chart for part-to-whole relationships.
- Avoid pie charts and rely on bar graphs instead. Pie charts are terrible ways to present data if you want people to understand the patterns they present. "Save the pies for dessert!"
- Use a line graph if the x-axis will show interval data. Remember, interval data are numerical, have a distinct order, and can be divided into equal portions.
    - Intervals should always be equal in size (e.g., time, salary distribution, etc). In this case there are data for every other years from start to finish.
    - Lines should only directly connect values in adjacent intervals. (Leave a gap if have missing data.)
    - The first of the following charts is a bad example of how to present interval data with missing data; the second is a good improvement. (These were taken from http://www.perceptualedge.com)
- Use a bar graph to show groups comparison. Typically this will be nominal or ordinal data.
- Use a scatterplot to show correlations.
- Use stacked bars to present cumulative totals.

■ ■ ■

(3) Show the data

Don’t decorate your data

- **3-dimensional graphs**
- **Pattern or gradient-fills:**

- **Excess decoration**

- **Grid and axes**
- **ticks**
- **Legends and legend borders**

References and resources