GRAPHIC CONSTRUCTION

6.1 Strategies

Broad steps in an analysis:

- A preliminary (mainly graphical) exploration of the data
- A deeper exploration based on the formulation, fitting and assessment (mainly graphical) of explicit models.
- Weaknesses or failures in a model are addressed by modifying and reassessing the model in an *iterative process* which continue an adequate model is obtained.

Important elements of Graphic Construction:

- Iteration. Begin with a basic high-level function and then make a sequence of modifications by changing the arguments to this function and incorporating low-level functions to produce the desired graphic.
- Purpose. Graphics should always be constructed for a clear purpose and, to be successful, should achieve that purpose.
- Comparison. The best graphics are likely to be those that facilitate and encourage *comparison*.
- Interpretability
- Visual Phenomena. Graphics exploit the power of visual phenomena.

6.2 Principles of Graphic Construction

- Presentation graphics versus Analysis graphics.

Four basic principles:

1. Graphics should have substance.
2. Graphics should be based on good statistics.
3. Design aspects should be appropriately chosen to reflect balance, proportion and a sense of scale.
4. Graphics should be simple.

Errors in Graphical Construction

a) Misrepresentation of data
b) Redundant dimensions
c) Excessive Decoration
d) Multiple axes on the same plot
e) Gratuitous meddling with convention

6.3 Visual Perception

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1. Effect of different syntax

2. Effect of symbol choice

3. Effect of scale
   Organisation: (b) and (c) are alternative perceptions of (a)

4. Effect of familiarity of emergent forms

5. Effect of continuation

6. Figure-Ground phenomenon
   (vase or face)

7. Differences between ordinates (a)
   Precise relative magnitudes (b) and (c)

8. Effect of perception of dimension
   Projection of cubes

9. Effect of intention: silhouette.

10. Effect of loose-jointedness: are arcs I and II on the same side? Escher.

11. Distortions