12

Speaking about Numbers

SOLUTIONS

1. Slides for material in box 11.1.

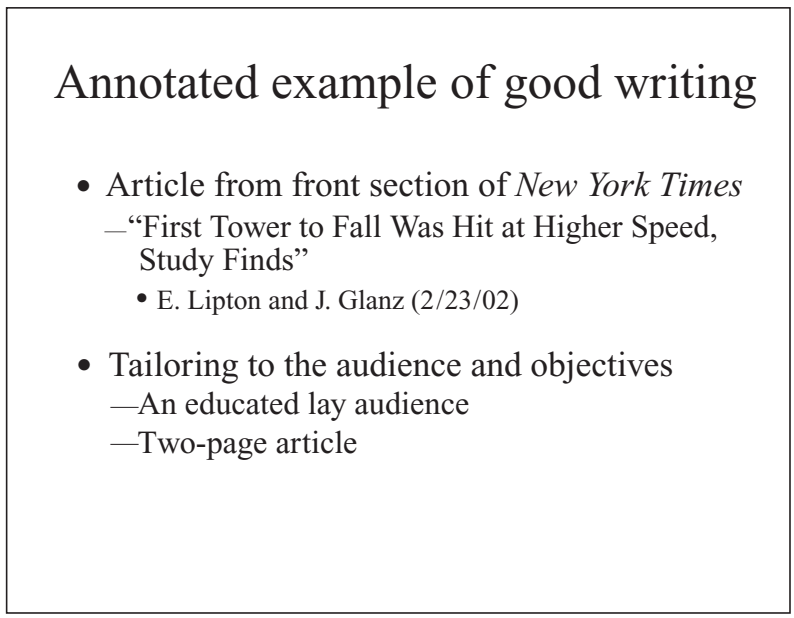


Figure 12A.

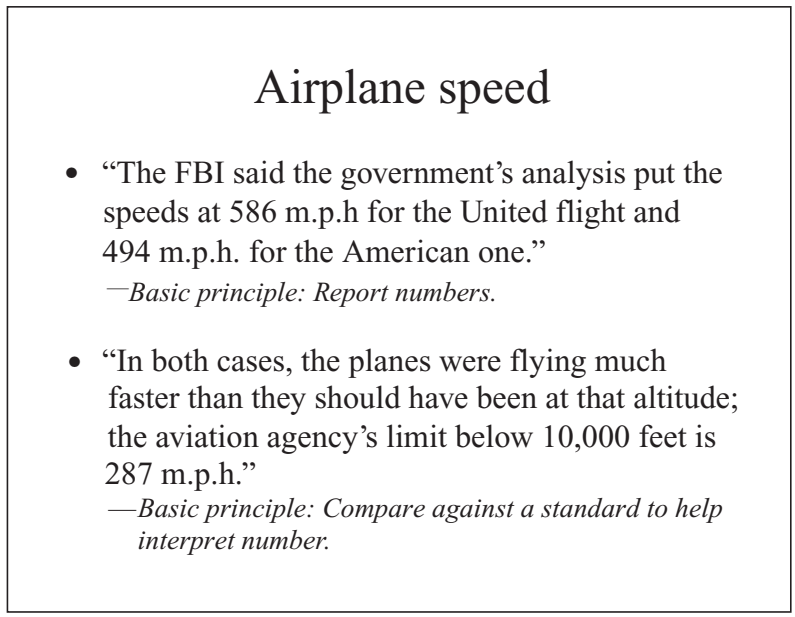


Figure 12B.

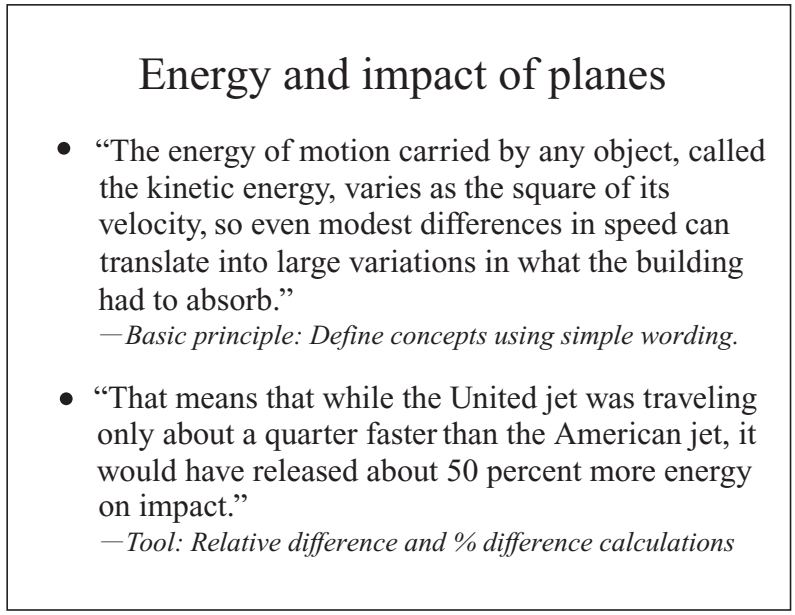


Figure 12C.

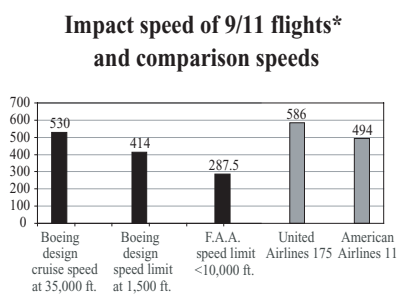
Just how much energy is that?

- "Even at a speed of only about 500 m.p.h., a partly loaded Boeing 767 weighing 132 tons would have created about three billion joules of energy at impact, the equivalent of three-quarters of a ton of T.N.T."

  —*Basic principle: Interpret numbers and relate them to familiar quantities.*

Figure 12D.

How did speeds compare to design limits?



- Uses a bar chart to illustrate speed of planes relative to important benchmarks.

  —*Basic principle: Choose the right tools.*

- Describe patterns in chart by pointing out that planes' speeds exceeded design limits.

  —*Basic principle: Compare against meaningful cutoffs.*

Figure 12E.

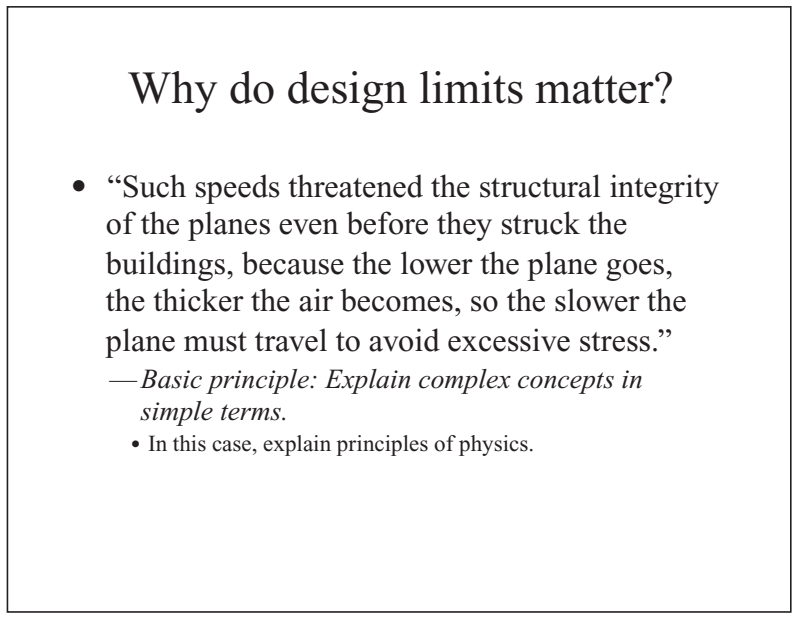


Figure 12F.

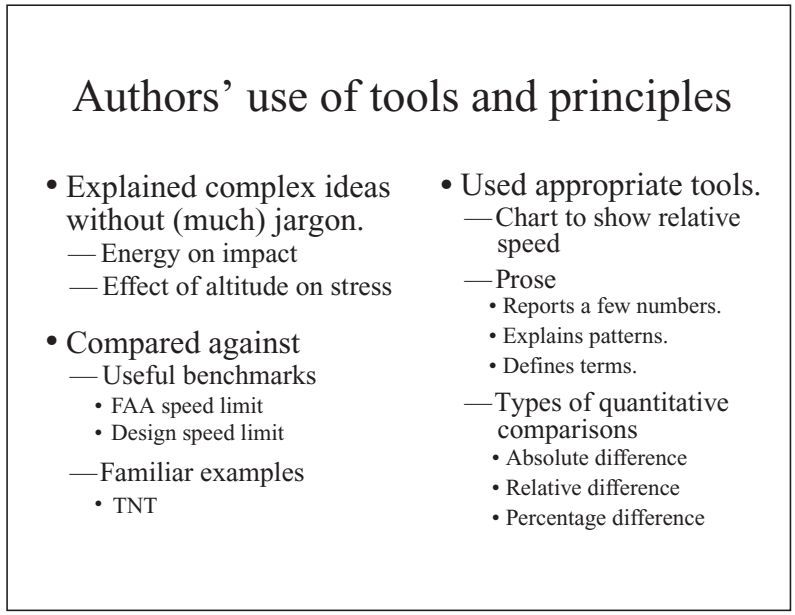


Figure 12G.

3. Slides for a scientific audience.

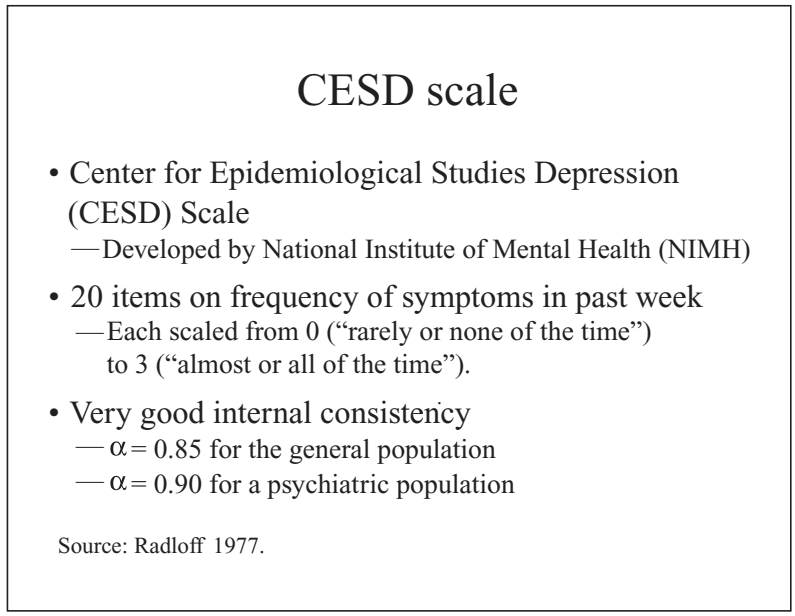


Figure 12H.

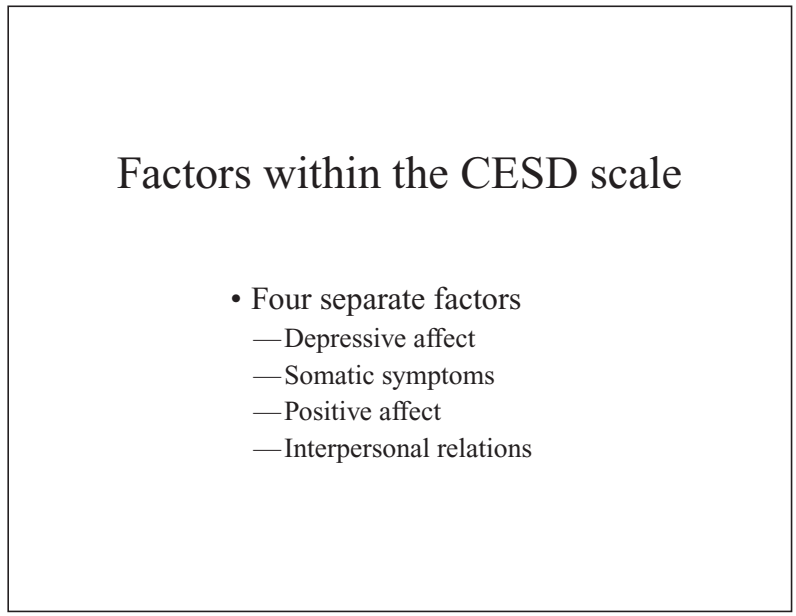


Figure 12I.

5. "Vanna White" notes to tables and charts.
   a. "Table 6.1 shows the distribution of households by type of household, race, and ethnic origin in the United States in 1997. Households are divided into family and nonfamily households, shown in the

middle and right-hand sections of the table. The racial distribution of all households is in the leftmost column of numbers. All numbers are reported in units of thousands, meaning that there are 102 million households when all races and household types are combined. Distributions of household types are also broken out separately by race and Hispanic origin—shown in the rows." [Then point out the modal household type and how it compares to other household types of interest, overall, and by race.]

b. "The distribution of federal outlays by major function in the United States in 2000 is shown in figure 7.2b." [Define the slices and point out their respective colors in the pie or legend as you describe the relative shares of the outlay categories, as in the answer to question 1, chapter 11.]

c. "Figure 7.5a shows how the relative chances of emergency room use among asthmatic children varied by family income and race in the United States in 1991. Income groups (poor, near poor, and non-poor) are arranged from left to right along the horizontal axis [wave along the axis]. There is a different color bar for each racial group—black for black children and gray for non-black children [point at legend or one cluster of bars]. The heights of the bars show the relative chances of emergency room use for asthma, compared to non-poor, non-black children (the reference category) [point at pertinent bar]." [Then describe the patterns by race and by income as in appendix A.]

d. "The age pattern of death rates in the United States in 1996 is shown in figure 7.15b. Age is grouped into five-year age categories across the *x*-axis. Death rates are shown on a logarithmic scale on the *y*-axis, measured in number of deaths per 100,000 persons in the pertinent age group. The logarithmic scale is used to allow a wide range of death rates to be shown on a single graph without obscuring differences at the low end of the range. [For a lay audience, add] That means that the distance between successive marks on the *y*-axis corresponds to a 10-fold increase in death rates. For example, death rates increase by nearly a multiple of 10 between the age groups 20–24 and 50–59 (from 101.3 deaths per 100,000 persons to 851.3 per 100,000). Death rates increase by another factor of 10 between the age groups 50–59 and 80–84 years." [Then go on to describe the J-shaped pattern, as in the answer to question 3 from chapter 9.]