

HOW TO STAY OUT OF BARS

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NOW that I have your attention, let me explain that the purpose of this article is to convince you that, in scientific publications, bar charts can be replaced with more informative dot charts. In addition, I show how writers and editors can easily create accurate dot charts in word-processing programs. This ability allows us to suggest improved figures to our authors in a format that is almost camera-ready.

Sample data are given in the table. Vertical column charts (Figure 1) and horizontal bar charts (Figure 2) of these data use the length of thick

columns or bars to represent the value of the data. Such charts are useful when projected from overhead transparencies or slides because the color and thickness of the bars make data visible to large numbers of people. However, they are neither necessary nor desirable for individual readers of the scientific literature.

Figures 1 and 2 each display only the seven sample data points (here, median values, the values that divide distributions into higher and lower halves). The data, however, are overshadowed by the very weight of the bars that present them; that is,

TABLE. SAMPLE DATA PRESENTED IN THE FIGURES.

Group	Median Value
Alpha	30
Beta	60
Chi	50
Delta	40
Epsilon	30
Fi	20
Gamma	60

FIGURE 1. SAMPLE DATA DISPLAYED AS A COLUMN CHART.

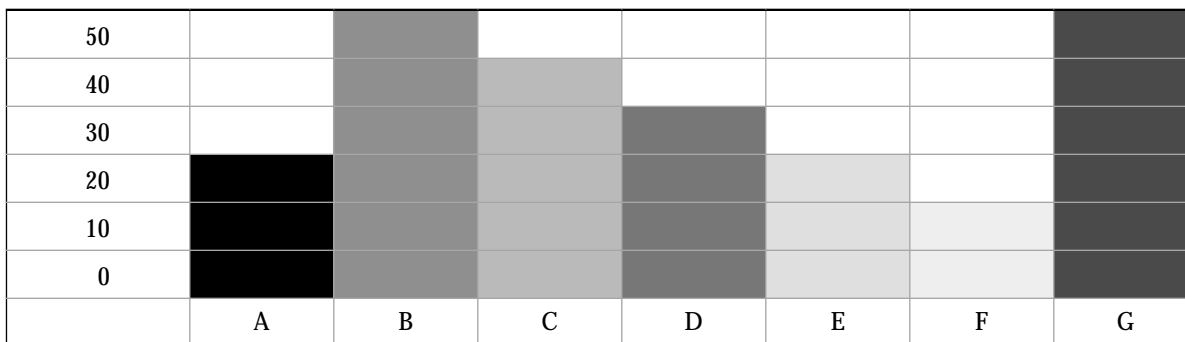


FIGURE 2. SAMPLE DATA DISPLAYED AS A BAR CHART.

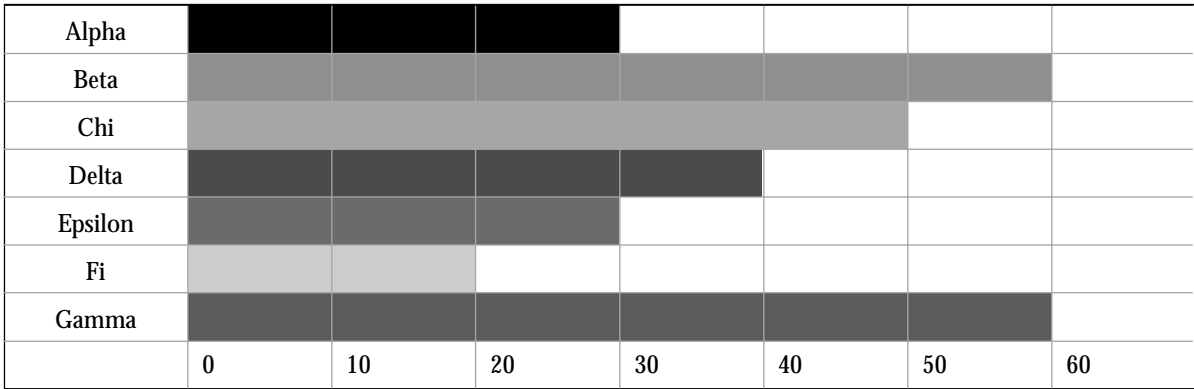


FIGURE 3. SAMPLE DATA DISPLAYED AS A DOT CHART.

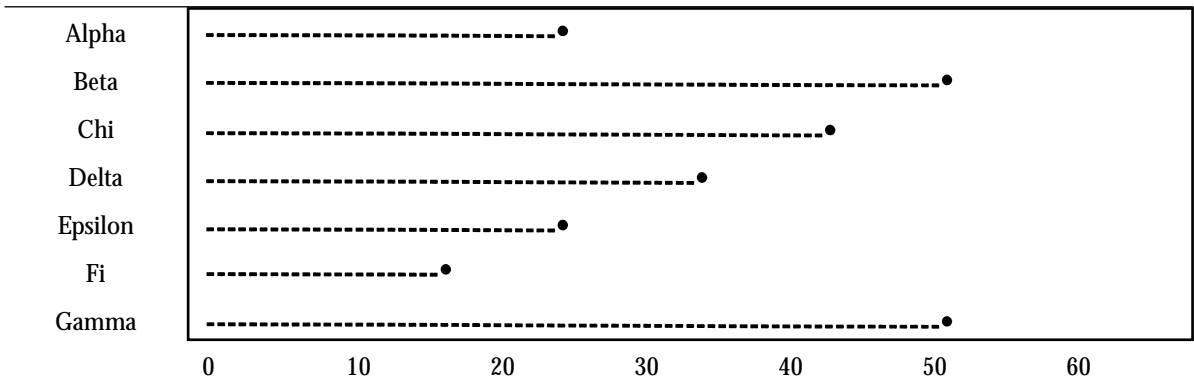
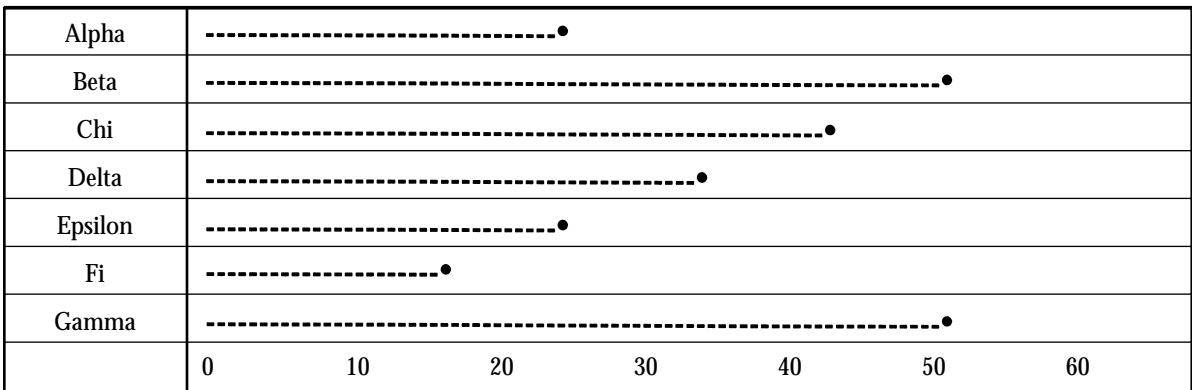


FIGURE 4. SAMPLE DATA IN FIGURE 3 SHOWING ALL THE LINES OF THE TABLE USED TO FORMAT THE CHART.



all we are really interested in is the distance between the end of the bar or column and the axis. So readers focus their attention on the large areas of color or shading and not on the tops of the columns or the ends of the bars, where the data are.

Figure 3 is a dot chart of the same data. Here, the dots indicate the data. In fact, the dots emphasize the data, which is a characteristic of a good graphic. The data are also displayed horizontally, so the variable names can be read easily.

Figure 4 shows how Figure 3 was created. I simply inserted a 2 x 8 table into my word-processing file and put the variable labels in the left column and constructed a data field in the right one. I had to play with the spacing to make the scale fit the column, but once the scale was done, graphing the data was easy. Any of several symbols can be used to indicate data.

Now suppose that the sample data are the median values of continuously distributed data (which they are; Figure 5). With a little more work, the minimum, maximum, 25th percentile, and 75th percentile values of the distribution are shown.

25th percentile, and 75th percentile values can be added without using any additional space. Now, we can compare seven distributions, not just seven median values.

In Figure 6, the data are arranged by magnitude, rather than alphabetically, which again helps readers to compare the distributions. An alphabetic arrangement helps readers find a specific group of data faster and is the preferred arrangement for reference tables. Often, however, we want to compare the data directly, in which case arranging the distributions by magnitude is preferable. (Figure 6).

For more information on dot charts and the perceptual tasks involved in interpreting visual images, see *The Elements of Graphing Data*, by William Cleveland.¹

REFERENCE

1. Cleveland W. *The Elements of Graphing Data*. Summit, NJ; Hobart Press, 1985.



FIGURE 5. SAMPLE DATA PRESENTED AS DISTRIBUTIONS ON A DOT CHART IN ALPHABETICAL ORDER. THE MINIMUM, MAXIMUM, 25TH PERCENTILE, AND 75TH PERCENTILE VALUES OF THE DISTRIBUTION ARE SHOWN.

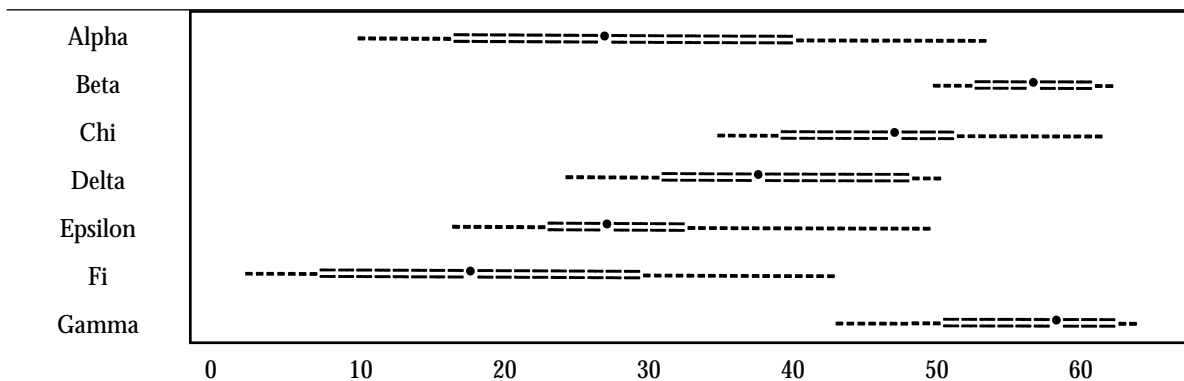


FIGURE 6. SAMPLE DATA PRESENTED AS DISTRIBUTIONS IN ORDER OF MAGNITUDE ON A DOT CHART TO FACILITATE VISUAL COMPARISONS.

