Lecture Supplement: Z's, Box PLOTS and Effect Size

Practice & Recognition:

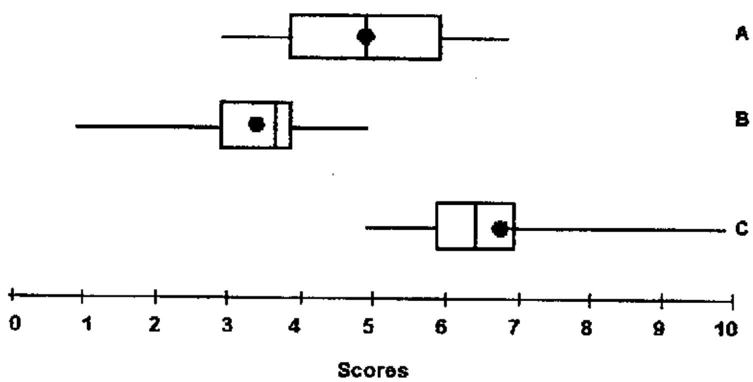
1. Two oldsters were sitting on a park bench talking about the old days. The golfer bragged that he had a 76 average when he was in his prime. The bowler snorted and said that his league average was 210 when he was in his prime. What additional information would you need to determine who was the better of the two?

2. Discuss Box Plots, Do One and Make One.

   * The left-end is the 25th percentile and the right-end is the 75th percentile score
   * whiskers extend to the extreme scores (range)
   *the dot is mean
   *vertical line in box is median

   For boxplots, A,B and C:

   a. Which frequency distribution(s) is (are) positively skewed?
   b. Which frequency distributions have equal ranges?
   c. Which frequency distribution has a 75th percentile score of 6?
   d. What is the mean of distribution B?
   e. What is the median of distribution C?



Effect Size (size matters):

3. Effect Size Index: Gives you a mathematical way to answe the question how much is more?

$$d= \frac{|\bar{\mu}_1 - \mu_2|}{\sigma} = \frac{|\bar{X}_1 - \bar{X}_2|}{\sigma}$$

Small effect d=.20
Medium effect d=.50
Large effect d=.80

TABLE 4.2 Descriptive statistics for a Descriptive Statistics Report of the heights of women and men

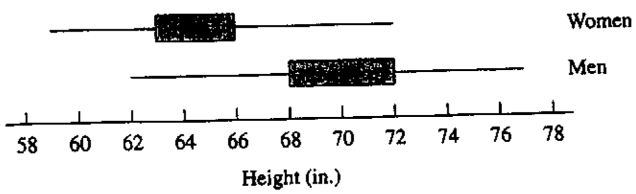
	Heights of 20- to 29-year-old Americans	
	Women (in.)	Men (in.)
Mean	64.3	69.7
Median	64	70
Minimum	59	62
Maximum	72	77
25th percentile score	63	68
75th percentile score	66	72
Effect size index	1.92	

- Overlap of the two distributions
- Interpretation of the effect size index

To illustrate a Descriptive Statistics Report, let's return to the heights of the men and women that you began working with in Chapter 2. The first step is to assemble the statistics needed for boxplots and to calculate an effect size index. Look at **Table 4.2,** which shows these statistics. The next step is to construct boxplots (your answer to problem 4.8). The final step is to write a paragraph of interpretation. To write a paragraph, I recommend that you make notes and then organize your points, selecting the most important one to lead with. Write a rough draft. Revise the draft until you are satisfied with it.[5] My version is **Table 4.3,** a Descriptive Statistics Report of the heights of women and men.

TABLE 4.3 A Descriptive Statistics Report on the heights of women and men

The graph shows boxplots of heights of women and men. The difference in means produces an effect size index of 1.92.



The mean height of women is 64.3 inches; the median is 64 inches. The mean height of men is 69.7 inches; the median is 70 inches. Men are about 5 inches taller than women, on average. Although the two distributions overlap, more than 75 percent of the men are all taller than 66 inches, a height exceeded by only 25 percent of the women. This difference in the two distributions is reflected by an effect size index of 1.92, a very large value. (A value of 0.80 is traditionally considered large.) The heights for both women and men are distributed fairly symmetrically.