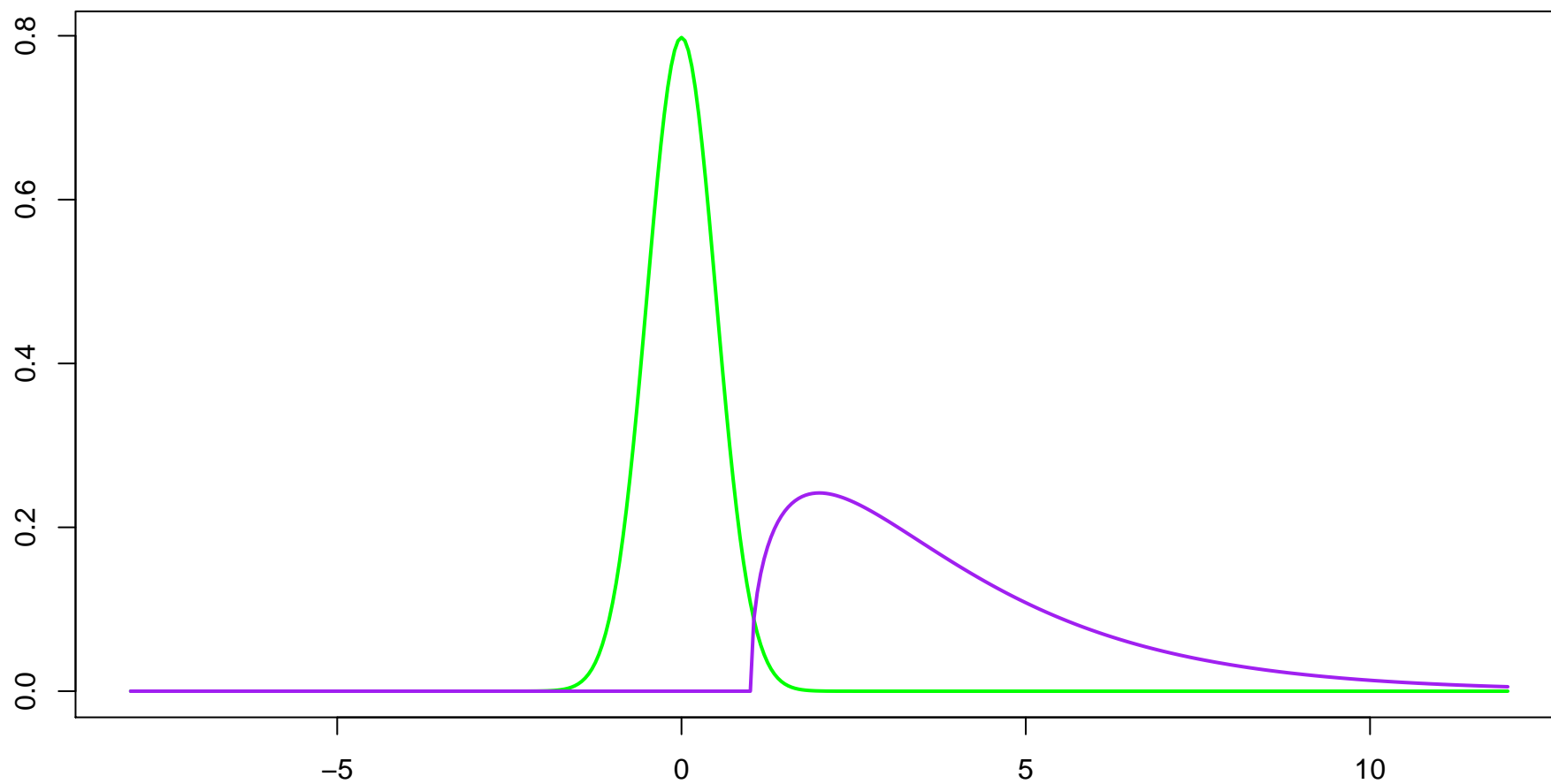


# Population Attributes

Introducing Chapter 6 in the First Edition of  
*An Introduction to Statistical Inference and Its Applications with R*

Michael W. Trosset  
Department of Statistics  
Indiana University, Bloomington



How do  $X \sim f$  and  $Y \sim g$  differ?

## Some Differences

1.  $X(S) \neq Y(S)$
2.  $f$  is symmetric about 0, whereas  $g$  is *skewed to the right*.

Here is a formal definition of symmetry:

Let  $X$  be a continuous random variable with probability density function  $f$ .  
If there exists a value  $\theta \in \Re$  such that

$$f(\theta + x) = f(\theta - x)$$

for every  $x \in \Re$ , then  $X$  is symmetric and  $\theta$  is its center of symmetry.

3. The values of  $Y$  tend to be larger than the values of  $X$ .  
In particular, the “middle” of  $g$  lies to the right of the middle of  $f$ .  
Various *measures of centrality* formalize the notion of “middle”.
4. The values of  $Y$  tend to vary more than the values of  $X$ , i.e.,  
 $g$  is more “spread out” than  $f$ .  
Various *measures of dispersion* formalize the notion of “spread”.