

- (a) The shapes of the distributions of sugar content per serving differ between the 1-cup and  $\frac{3}{4}$ -cup cereals: the 1-cup distribution is skewed left while the  $\frac{3}{4}$ -cup distribution is roughly symmetrical. The sugar content is generally higher in the 1-cup cereals with median of 13g vs. median of 10g for  $\frac{3}{4}$ -cup cereals. There is more variability in the 1-cup cereals' sugar content w/IQR =  $15 - 4 = 11$ g vs. IQR =  $12 - 8 = 4$ g for the  $\frac{3}{4}$ -cup cereals.
- (b) The distribution of sugar content is the same as in step (a) for the 1-cup serving size cereals (because this was already measured per cup). However, the  $\frac{3}{4}$ -cup serving size distribution changes: the shape is still symmetrical, but the median sugar content shifts up and is now a median of 13g, which is slightly higher than the 1-cup cereals. The variability has also increased to an IQR of  $16 - 10.5 = 5.5$ g, although it is still lower than the 11g IQR for the 1-cup cereals.
- (c) Using the boxplots from part b, the medians are now roughly the same at approximately 13g for both 1-cup and  $\frac{3}{4}$ -cup cereals ( $\frac{3}{4}$ -cup very slightly higher). The 1-cup distribution is significantly skewed left, so the tail would pull the mean down below the median while the mean for the  $\frac{3}{4}$ -cup distribution will remain near the median due to its symmetry. Therefore, we would expect the mean sugar content to be lower for the 1-cup distribution than  $\frac{3}{4}$ -cup distribution mean.