Research Methods 2: Week 3

Appendix 1: computing medians and quartiles

Once the sample has been sorted into ascending order the median is the middle value. More precisely, if the sample contains n values then the median is the ½(n+1)th largest value. In the example n=99, so n+1=100 and the median is the 50th largest value. Had the sample been of size 100, for example another child, of height 118.1cm, been measured, then the median would have been the ½(100+1)th = 50½th largest value. Of course, there is no 50½th largest value until we interpret what is meant by a fractional rank. In this augmented sample the 50th largest value is 108.7 cm and the 51st largest value 108.8 cm: the 50½th largest value is interpreted as being ½ way between these values, i.e. the median of the augmented sample is 108.7 + ½ (108.8 - 108.7) = 108.75 cm.

The definitions for the quartiles follow by analogy. The lower quartile for a sample of size n is the ¼ (n+1) th value and the upper quartile is the ¾ (n+1) th largest value. In the example above where n+1 = 100, the lower quartile is the 25th largest value and the upper quartile is the 75th largest value. This definition could result in fractional ranks of ¼ and ¾ which are interpreted in the same way as above. In the augmented sample of size 100, n+1 = 101 and lower quartile is the 25¼ th largest value: this is ¼ of the way from the 25th to the 26th largest value. The 25 th largest value is 105.6 cm and the 26 th largest value is 105.7 cm, so the lower quartile is 105.6+ ¼ (105.7-105.6) = 105.625 cm.

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